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Moxa has launched the first rack-mounted Layer 2/Layer 3 managed switches that support full Gigabit hardware time-stamping and offer selectable RJ45/SFP/PoE+ interfaces and dual power modules to ensure suitability for a variety of applications. See this month’s cover story on page 22 for more on these innovative new industrial networking products.
Digitalisation in the mining industry

With South Africa now in recession, and the unemployment rate rising to over 27%, the government’s focus has quite rightly shifted to the issues of job creation and economic stimulus. This has put critical industries such as mining and manufacturing, which in recent years have been shedding jobs at an alarming rate, firmly back in the spotlight. It was interesting then to see the emphasis given to the benefits of digitalisation in mining by the automation vendors who showcased their offerings at Electra Mining 2018.

Globally, the mining industry has been under pressure to improve margins since the collapse in commodity prices that followed the economic meltdown in 2008. Even though prices have mostly recovered, and the local miners benefit from the weaker Rand/Dollar exchange rate, new investment in the sector has been slow and as a result ore grades are on the decline. Despite the tension that exists around automation in mining due to the perceived threat to jobs, the digital technologies of the Industry 4.0 era have the potential to unlock value by eliminating the traditional operational ‘silos’ that have always existed across mining’s hierarchical disciplines. The challenge then is to address the aspect of future workforce development and integration in ways that allow mine managers to access the compelling benefits of autonomous operation, without neglecting their social responsibilities to the local communities which must benefit from their operations.

Digitalisation in mining is focused at making mines more efficient through lower operating costs, higher yields, improved safety standards and greater levels of regulatory compliance. It works to identify and eliminate problems such as wrong task allocations, misplaced equipment, inaccurate data and delayed communication, through its ability to provide the right information to the right people in real time, without anyone making any extra effort.

Siemens was one of the automation exhibitors at Electra Mining to focus on the benefits of digitalisation. Based on its extensive experience in industrial applications, the company is well positioned to address the specific challenges of the mining industry through end-to-end process automation and instrumentation solutions, the Comos application software for digitalised production, and the XHQ operations intelligence software that gets business-related data to managers for real-time decision making.

The power of the Comos software is its ability to develop and test the operations on a mine using realistic digital models before anything is ever actually built. Comos Walkinside allows mining engineers to develop a powerful 3D virtual reality application (the digital twin in action), which can be used for immersive operator training, amongst other things. It also enables efficient data exchange with third-party applications, as well as distributed real-time collaboration across geographical and operational areas.

Since Comos Walkinside can deliver a complete virtual replication of a plant, it allows operators to be trained safely on high value equipment in a 3D virtual world, as if they were on a real plant but without putting any lives or equipment at risk. As such, it is an environment for educating and upskilling personnel – a key requirement if we are to grow our mining sector back to its glory days and create new jobs at the same time. Even better, it can be used to train both mine workers and maintenance personnel, and since it is an open platform, there is room to support an entire new ecosystem of application developers. There is no doubt that the Fourth Industrial Revolution will make some jobs obsolete, particularly the repetitive manual kind, but on the flip side it will also create a plethora of new opportunities. This is what we should embrace if we do not want to get left behind. See this month’s mining feature starting on page 24.

Buyers Guide 2019
A special vote of thanks from the I&C team to all those suppliers who once again took the trouble to update their company information so that we could compile the 2019 edition of the SA Instrumentation and Control Buyers’ Guide. If you would like to get your hands on a copy, see page 5 for details.

Steven
Editor: SA Instrumentation & Control
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### IFS study shows 26 percent increase in digital transformation

IFS, the global enterprise applications company, has released a research study of digital transformation budget trends of 200 North American manufacturing executives, which reveals more than half of respondents expect their budgets for digital transformation to increase in the next two years.

The IFS study also shows that substantial investments have already been made in digital transformation initiatives, leading to a 26 percent increase since a 2015 study in companies saying their enterprise software did a good job preparing them for digital transformation. Based on the results from the study, IFS believes digital transformation will continue to accelerate in coming years, since only five percent of respondents expected their budgets to decrease. Analytics and mobility projects were the most frequently funded among respondent companies.

### ABB and Nobel Media announce international partnership

ABB and Nobel Media today announced an international partnership, bringing together two respected organisations committed to the development of innovation, education and scientific research, making ABB one of a select group of Nobel International Partners.

Nobel Media, an entity within the Nobel Foundation, extends the reach of the Nobel Prize to millions of people around the world through inspirational events, digital media and special exhibitions and activities related to the legacy of Alfred Nobel and the achievements of the Nobel Laureates. Through these activities and events – including global Nobel Prize Dialogue gatherings – Nobel Media reaches and engages students, decision makers and a curious general public around the world.

The ABB-Nobel Media partnership aims to share knowledge broadly, inspire people to engage in science and shed light on our time’s greatest challenges. As a pioneering technology leader, ABB will bring deep scientific and innovation experience and commitment into the partnership.

### Yokogawa Receives SICE award

Yokogawa Electric Corporation announced that it has received a Technology Award from the Society of Instrument and Control Engineers (SICE) for its achievements in the development of an IIoT-enabled flow configuration tool.

Yokogawa’s FlowNavigator is a software tool that is used to configure the flow parameters for multivariable transmitters and vortex flowmeters and thereby ensure the precise measurement of mass flow. With its support of the latest FDT standard, this software allows users to monitor the status of their instruments on a smartphone or an Ethernet-enabled device from anywhere and at any time. Compatibility between the FDT2.0 and OPC UA industrial standards allows the integration of FlowNavigator data with data from manufacturing execution systems (MES), enterprise resource planning (ERP) packages, and other software. For its achievement in developing key technologies for an asset management tool that makes full use of the IIoT to measure mass flow, Yokogawa received the award on September 13.
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Partnerships evolved with Schneider Electric’s Partner Portal for IT

Schneider Electric South Africa has revamped its online portal for IT Channel Partners to enhance support, enablement and overall experience with a focus on providing more efficient and intuitive access to incentives, training and support, product information, tools, and more.

The Partner Portal for IT Channel Partners features a variety of online support tools and access to numerous training guides and practical solutions. It also serves as a network, which provides access to information on the latest data centre infrastructure products and solutions.

“Through this portal we aim to make it easier for our partners to engage with us, offering them an opportunity to achieve their business goals, while increasing the benefits, privileges, and profit opportunities available to them at each stage in the programme,” says Chetan Mistry, channel development manager, Schneider Electric ITD Anglophone Africa.

The easy-to-use platform includes essential training to maintain partner certification levels, marketing collateral and sales tools, as well as opportunity registration, lead generation, networking opportunities, free training and a rewards programme. The portal also enables the partner’s sales teams with access to ISEL, a module that provides sales support material including brochures and technical sheets. The iMarket module provides teams with access to ready-to-deploy marketing campaigns, enabling them to build demand within the end user base.

To save time, partners can now gain access to a design tool to help with integrated solutions when it comes to scalable power and cooling, racks, power distribution and innovative monitoring and management software that act as one system for a total IT infrastructure and monitoring solution.

“Schneider Electric is a channel-focused organisation, where we place great value on the mutually beneficial relationship we have with our partners,” concludes Mistry. The portal provides our partners with everything they need to achieve their financial goals as they are instantly connected to a global leader in the ever-changing IT world, allowing them to be in control of their growth along with the technology shifts.”

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Driving local manufacturing capabilities

There is enormous potential for southern African manufacturers to increase their market-share both locally and internationally and the driving force behind this opportunity is the South African Capital Equipment Export Council (SACEEC).

According to SACEEC CEO Eric Bruggeman, part of the Council’s mandate is to organise outward selling and inward buying missions: “We identified a need to showcase the offerings of the SADC region’s local manufacturers in an interactive manner. The result is the inaugural Local Southern African Manufacturing Expo (LME) being held at the Expo Centre, Nasrec from 21 to 23 May 2019.”

“Endorsed by the premier of Gauteng, David Makhura, we believe that the event will enable exhibitors to meet with top decision makers from the inward buying missions already committed to the expo,” says Charlene Hefer, portfolio director for Specialised Exhibitions Montgomery.

“As Industry 4.0 continues to transform the way that manufacturers do business, LME 2019 will provide them with an opportunity to grow their customer base, with a knock-on potential for fostering job creation.”

“It is critical for the sustainability of local manufacturing operations that they aggressively pursue opportunities to increase their market share,” adds Bruggeman. “Not only is this relevant to their increased permeation of the overseas market, but also, they need to capture market share that is currently being monopolised by importers. Recent statistics indicate that South Africa currently imports products to the value of a staggering $83.2 billion. If we were able to shift this demand to the local manufacturing sector, we could realistically create 1 329 million jobs.”

Held during Africa Week, LME 2019 will give manufacturers from South Africa and other SADC regions a chance to display their capabilities and capacities to a captive audience and create a forum for exhibitors to network with their peers.

“We are excited by the prospect that local manufacturing operations will evolve and expand through interaction with the inward buying mission representatives,” concludes Hefer, “added to this are the benefits derived through the support of SACEEC, together with AREI (Association of Representatives for the Electronics Industry) and the DTI (Department of Trade & Industry). We urge local manufacturing companies throughout southern Africa to capitalise on the unique opportunities of exhibiting at LME 2019.”

For more information contact Natasha Heiberg, Specialised Exhibitions Montgomery, +27 10 003 3083, info@localmanufacturing.co.za, www.localmanufacturingexpo.co.za
RS Components partnered with The Tshwane University of Technology (TUT) for the Sasol Solar Challenge ten-year anniversary race. With the experience gained in previous races, the team was determined to reduce the gap to the world’s leading teams through investigation and application of the best designs.

In an interview, team leader, Johannes de Vries said the team would manufacture most of its mechanical components at the institution, and believes that they are now better equipped and more knowledgeable about the requirements and expectations of the race.

“This year is definitely different, because of the more demanding regulations in terms of the solar panel size reduction,” he explained.

“Now, there is more focus on reducing the weight of the car since there is less energy available. It will be smaller in size and more aerodynamic compared to previous models. We also experienced that the more we work on the design the more we gain better clarity and understanding of how to improve the design. I am confident that we are well resourced for this year’s race and believe that we are well placed to challenge the other teams.

RS Components is focused on inspiring the next generation of engineers by supporting university programmes that are aimed at increasing an interest in STEM (science, technology, engineering and mathematics) careers, and creating an ecosystem where innovation and engineering talent can thrive. The TUT Solar Car project encourages engineering students to experiment with innovative new technologies and broaden their knowledge with practical skills that tackle real-world challenges.

RS sponsored various components and tools to the TUT team to help construct and get SunChaser 3 on the road. “We’re extremely proud of the calibre of the engineers and technicians that are being developed in South Africa,” said Brian Andrew, managing director of RS Components in sub-Saharan Africa. “Our role is to give them access to the tools, components and resources they require to design, build and maintain the innovations of tomorrow. We wish the TUT team all the best for the future.”

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za

RS Components promotes new Africa website in Zambia

At the recent Mining & Technical Exhibitions event in Zambia, RS Components promoted its recently launched Africa website (www.rsonline.africa) geared to meet the requirements of a growing continent with demand from various industries such as manufacturing, mining, automotive, utilities, electronics and the IIoT.

“Customers in Africa had access to our products prior to the website, however there were long lead times and higher freight costs depending on location,” explained Brian Andrew, managing director of RS in South Africa. “Through the new website, customers will receive their orders much quicker and they can pay via credit card.”

Zambia is home to some of the world’s largest copper mines. Kalumbila mine (also known as Sentinel) is located in north-western Zambia with estimated reserves standing at 1 billion tonnes of ore. Also in the region is Kitwe, the hub of the Copperbelt that sprouted in the province over the last decade. It is also second largest city in Zambia and one of the most developed commercial and industrial areas in the nation. With the new RS Africa website, mines and other industrial businesses in Zambia will now have fast, convenient access to over 500 000 quality products and electronic components from 2500 global brands.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za
Top BBBEE rating for Zest is part of commitment to SA

Steadily integrating its continuous improvement efforts alongside the transformation of its business, the Zest WEG Group recently achieved Level 1 status in terms of Broad-based Black Economic Empowerment (BBBEE) ratings. A subsidiary of the Brazil-based multinational WEG, the Zest WEG Group is over 51.6% black-owned, including a 32.1% stake by black women. It was ranked as Level 2 last year.

“Our real success here has been to ingrain our commitment to South Africa and to transformation in the everyday activities and culture of the business,” says chief executive officer, Louis Meiring. “Our empowerment journey is not an annual tick-box exercise, but rather is driven by every staff member working to build local capacity, people and excellence.”

According to the group’s operations director, Juliano Vargas, “Reaching this pinnacle BBBEE rating has been the culmination of various efforts and is just one indication of the investment that we are making in the country’s economy and society.”

From its position as an ISO 9001-listed business, Zest WEG Group was recently one of the first to upgrade to ISO 9001-2015, making it one of only 112 companies out of 2200 South African firms with ISO 9001 certification to reach this next level. The group has also recently invested heavily in its Heidelberg transformer manufacturing plant, where it operates one of the country’s leading test laboratories for transformers.

“We are also moving strongly into the renewable energy space, and this will support government efforts to develop this sector of the economy – as outlined in its recent Integrated Resource Plan,” concludes Vargas. “Our product expansion includes items like steam turbines, wind turbines and solar panels.”

The focus on continuous improvement has necessarily been accompanied by developing the company’s skills-base in industrial manufacturing and engineering well beyond the legal requirements of BBBEE. Knowledge from WEG’s plants in Brazil is also being shared to allow local operations to become more independent in terms of know-how and expertise.

IoT.nxt opens US office with multimillion dollar project in place

South African innovator IoT.nxt recently opened an office in the USA after the establishment of its first international office in The Hague last year. Together with partners, Ensight Solutions and Minimise USA, the company is rolling out a multimillion dollar project at schools in Florida and Dallas using IoT technology to optimise energy consumption.

“Many building management operations use pre-set systems to switch energy facilities on and off at particular times in order to reduce consumption,” explains IoT.nxt CEO, Nico Steyn. “IoT strategies allow building managers to effect optimal energy usage in a building. IoT technology makes it possible to take various factors, for instance occupancy and ambient external temperature, into account to adjust energy used to change the temperature inside a building, or to purify the air. This optimisation can deliver significant cost savings. IoT.nxt’s solution, which allows for retrofitting of any existing equipment and systems, closes the gap for facilities managers.”

According to Daniel Badran, chairman and CEO of Minimise USA, IoT.nxt secured a licensing agreement with Efficient Industry (EI), through which IoT.nxt is now the preferred IoT technology provider for the schools project. “The project, engineered by Ensight of Australia, places IoT.nxt in the driver’s seat as a partner to Minimise USA and Ensight for the education sector and others to come,” he says.

Francis Barram, CEO of Ensight Solutions, notes that the unique solutions unlocked through this partnership offer significant opportunity for similar projects in the future.

The project is being rolled out now and the first phase will run to the end of the month. Three team members from IoT.nxt South Africa are currently in the US to manage the project but the plan is to train employees at the partner companies to manage the further phases of the project.

“Expansion to the USA was a set goal for our company,” says Steyn. “We explored various opportunities late last year when IoT.nxt executives visited various leading technology companies and attended technology conferences to gain insight into US market realities. The project with Ensight and Minimise USA fast-tracked our USA strategy and, unlike the expansion into the Netherlands, which was made possible through a R100 million investment by Talent10, the US office was set up with a large scale project in place.”

Wayne Fitzjohn, chairman of IoT.nxt and CEO of Talent10, says the success of the company is exceptional, especially as it was founded when awareness of the IoT was limited. “The thinking and innovation delivered by the IoT.nxt team prove that South African companies can compete with the leading global technology giants and that we have the skills to embrace the opportunities offered by the fourth industrial revolution,” he concludes.

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Louis Meiring (left) and Juliano Vargas.

For more information contact Zest WEG Group Africa, +27 11 723 6000, info@zestweg.com, www.zestweg.com
Voltex Management Awards of Excellence

Voltex, a South African distributor of electrical and lighting products, prides itself on setting the benchmark for service and performance excellence in the industry. To achieve this requires a purposeful and determined pursuit of exceeding expectations.

The Voltex Group recognises the contribution made by individuals, business units and branches in achieving exceptional standards of excellence. These efforts were acknowledged and celebrated at the annual Voltex Management awards held recently at the head office in Senderwood.

Voltex Management congratulates all of the well-deserved winners. “I would hasten to add that we regard all of the Voltex team as winners in all they do to make our group a better one,” said Stan Green, CEO of Bidvest Electrical, after presenting the awards.

Voltex supplies a wide range of electrical and related products through its supply divisions and distribution outlets strategically located across southern Africa. Through this diverse network, the company services the agricultural, mining, manufacturing, electrical and communication sectors with a variety of products and services, which include energy efficiency, cable and wiring, power generation and optimisation, motor control solutions, industrial and residential lighting applications and a host of other highly specialised services.

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For more information contact Jennifer Naidoo, Siemens Digital Factory and Process Industries and Drives, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za

Flender has changed

Flender now has a new face in South Africa. Previously the Mechanical Drives business unit within Siemens Process Industries and Drives, in August 2018 the company became a separate legal entity, Flender Pty Ltd. “We are still a Siemens company, and will continue to collaborate on projects and within the various business units to ensure integrated solutions are offered, whilst using the entrepreneurial freedom given by this change to drive strategies with our customers providing value for them,” says CEO, Michael Cardoso.

“An important aspect of the change is the visibility of the Flender branding and we have used the Electra Mining event as the launch of the new Flender company.

Couplings, gear units and service

Cardoso says that the Flender offering has three segments. Firstly, there is a comprehensive range of couplings catering for application requirements up to 10 million Nm torque in various configurations, so they can be adapted to almost any customer need.

Secondly, there is a range of industrial gear units. The FSG range caters for standard applications such as conveyor and pump drives. In cases where the application is more complex, these standard units are adapted for customer-specific needs such as mixers and cooling towers. In addition, there are specific ranges of planetary gear units used in large applications in the mining and sugar industries.

“Thirdly, our aftersales service complements our product offering,” he continues. “We offer all the traditional services, such as repairs in our workshop or on the customer’s site, together with the provision of spare parts and spare gear units. In addition we can extend our service to engage with our customers on their installed base and assist them in planning their maintenance, thus extending the life of their equipment.”

Condition monitoring

Cardoso adds that the other focus area for Flender is condition monitoring and this is where digitalisation comes in. “We can assist customers to identify their critical high capital value items and install condition monitoring equipment on these machines,” he explains.

“The idea is that you can monitor the equipment on the plant and receive alarms when a problem is identified. In addition, this can be extended to include remote monitoring by specialists who can advise on trends. The condition monitoring is designed to provide long term value and minimise downtime for our customers in order to save them money.

For more information contact Jennifer Naidoo, Siemens Digital Factory and Process Industries and Drives, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
DLM to represent Precision Mass in southern Africa

Dupleix Liquid Meters (DLM) is proud to announce that it has been appointed as an official distributor for Precision Mass in southern Africa.

Founded in 1967, Precision Industries (now Precision Mass Products) is a leading manufacturer of a wide range of pressure and temperature measurement instruments. ‘Mass’ has built its brand by offering highly durable, robust and proven products to premium customers in various industrial sectors – products that are able to measure pressure from as low as 10” H2O all the way up to 4000 bar.

Precision Mass’ headquarters and manufacturing facility is ISO 9001-2008 certified, and uses manufacturing practices like Lean Six Sigma, which enables it to reduce lead times, optimise resources and operational costs, and continually improve process and product quality.

DLM has become an established player in the valve industry, proving now to be the same in instrumentation as it sets new standards through the addition of the Mass range of products. The company carries substantial stock and is also equipped to supply customised solutions.

For more information contact DLM, +27 11 457 0500, sales@dlm.co.za, www.dlm.co.za

Electra Mining Innovation Award for Beckhoff

Innovative new products were the focus on day two of the Electra Mining 2018 exhibition at Nasrec, where visitors were able to see a vast number of new technologies and products on display. To add further excitement, exhibitors were invited to enter their new innovations to be assessed by the independent adjudicator, SACEEC’s CEO, Eric Bruggeman. This year’s Innovation Awards covered three categories:

- South African Innovator, International Innovator: Mechanical, and International Innovator: Electronic. More than 60 products were reviewed across the three categories.

Industrial automation equipment supplier, Beckhoff Automation, won the International Innovation: Electronics Award for its EtherCAT system. Beckhoff implements open automation systems based on personal computer (PC) control technology with a product range that covers industrial PCs, I/O and fieldbus components, drive technology and automation software.

For more information contact Michelle Murphy, Beckhoff Automation, +27 11 795 2898, michellem@beckhoff.com, www.beckhoff.co.za

Appointments

- OEN Enterprises has appointed Dries Griessel as technical manager.
- OEN Enterprises has appointed Herman Welman as radiation sales engineer.
- OEN Enterprises has appointed Nazaan Walters as electronics technician.
- OEN Enterprises has appointed Buhle Metsing as technical assistant.
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In an exciting new initiative, the SAIMC is engaging with the Intsimbi Future Production Technologies Initiative (IFPTI) in a drive aimed at changing the face of automation in South Africa. At a high level workshop attended by representatives from the DTI, the European Union, the German Chamber of Commerce and Industry, Deloitte Consulting, industry leaders, tertiary institutions and SAIMC council members, speakers laid out how South Africa is responding to the fourth industrial revolution (4IR) through IFPTI and its implementing agency, the National Technologies Implementation Platform (NTIP). IFPTI is a partnership between government and industry through the Production Technologies Association of South Africa (PtsA). The goal was to discuss the scaling of this highly successful programme and how to bring resources to the table to add capacity and take it to the next level.

SAIMC vice president, Pregs Naidoo, set the scene by highlighting the SAIMC’s Vision 2025 and its three major projects – education and training, growth, and thought leadership in automation – and its considerable achievements in these areas. This was followed by incumbent president Annamarie van Coller’s presentation about the many challenges facing South Africa in educating and training automation professionals.

Response to the decline in manufacturing
According to a recent Accenture report, the disruptive technological environment created by 4IR will place one in three jobs in South Africa at risk – a total of 5.7 million jobs.

DTI chief director, Ilse Karg, said that government is concerned about the decline in the manufacturing sector and has responded by creating the Future Industrial Production & Technologies (FIP&T) unit, within its Industrial Development division, to look at the future of manufacturing and develop a policy and strategy to confront the challenges of the disruptive technologies that are part of 4IR. “We have a mandate to work in partnership with industry to build industrial capability. Industry is the driving force behind this programme, but with the full support of government – from the DTI right up to the presidency at cabinet level,” she added. “Our flagship project is the IFPTI initiative. The two elements are skills and enterprise development, and we see this as an extremely important programme to build skills capacity for the manufacturing sector. We have put significant funding towards it and are actively looking at additional sources so that we can upscale the project further.”

The Intsimbi model has succeeded in creating highly innovative industry-driven solutions that can be sustainably expanded. Dirk van Dyk is the CEO of NTIP and has been running the programme successfully for over a decade. Developed for the tooling and machining industry, it was relaunched in June 2018 to reflect its rising importance and potential for expansion. He said that NTIP is a private non-profit company and its job is to create a free technical education system for the future. It provides a platform for industry to develop enterprise competitiveness and technical skills development programmes. It focuses on capacity building through skills supply and enterprise development solutions combined with innovative funding partnerships.

Van Dyk added that the highly successful NTIP model uses a system design and solution approach. NTIP now has seven facilities countrywide equipped with the best technology money can buy. To date 2198 learners have enrolled, 98% from a previously disadvantaged background. “We work in clusters through colleges, centres of excellence, international partners, industry and assessment centres,” he explained. “We produce results not paper. We have developed a whole range of stackable qualifications aligned with SAQA, all the way up to a Masters in Tooling Engineering at NQF9.”

Funding required
Funding is the limiting factor and there is now a need to unlock sources that are not optimally deployed in order to upscale the project. The crux is the development of a new national partnership funding model for technical skills development for advanced manufacturing. Fredré Meiring of Deloitte Consulting and Frans Nortje of Ingenious Evolution Fund Managers added their thoughts on possible funding models. Their advice was to look at trust fund structures to help companies unlock funding capacity.

This was followed by a thought provoking Q&A session elaborating on all the issues. The big question was how the SAIMC could get involved by adding its voice, resources and support. “We have widespread recognition locally and internationally and have proved that it can be done,” concluded van Dyk. “The programme has succeeded in creating highly innovative industry driven solutions that are sustainable and will position South Africa’s advanced manufacturing sector for 4IR, which is transforming the global manufacturing landscape.”

For more information contact
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TwinCAT 3 and TwinCAT 2
Randburg 6-8 Nov 2018
Cape Town 6-8 Nov 2018
Port Elizabeth 13-15 Nov 2018
Durban 13-15 Nov 2018

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TC1001 – Process Measurement and Instrument Configuration 1
Sandton 3-7 Dec 2018

TC1002 – Process Measurement and Instrument Configuration 2
Sandton 10-13 Dec 2018

TC1003 – Process Measurement and Instrument Configuration 1 & 2
Sandton 3-13 Dec 2018

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TC-PNEU-B – Basic Pneumatics
Johannesburg 5-7 Dec 2018

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www.smcpneumatics.co.za

PLC281 – PLC CoDeSys
Johannesburg 21-23 Nov 2018

PA311 – Water Treatment
Cape Town 21-23 Nov 2018

HY511 – Basic Hydraulics
Johannesburg 5-7 Dec 2018

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Radiation Protection Officers – Training Course on the Use of Radioactive Isotopes in Industry
Johannesburg 20-21 Nov 2018

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michelle@mecosa.co.za,
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ST-7SERV2 – S7 Service & Maintenance Part 2
Pinetown 3-7 Dec 2018

MC-SMO-SYS – SIMOTION Systems & Programming Course
Midrand 3-7 Dec 2018

SD-SIMOPRO – Simocode DP and Pro V Retrofit, Wiring, Engineering
Midrand 10-14 Dec 2018

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Radiation Protection Officers

Who will benefit from this training?
Mechatronic Engineers

Who will benefit from this training?
Automation Engineers

Who will benefit from this training?
Mechatronic Engineers
Earlier this year, I enquired in one of my letters, that you ask yourself if you know where we are heading in the future with respect to the fields of Industry 4.0, automation, digitalisation and education and how it will impact your personal life daily and those around you, so that we as an organisation can be the guiding voice to others who need insight and guidance and to ensure that we are all ready and equipped for the personal development and change that we will have to go through.

Have you thought about it? Do you have a better understanding of what future jobs could emerge in these areas, or what opportunities there are to grab onto? Are there technologies you should be learning about that you are procrastinating on?

**SAIMC and the Automation Federation**

The SAIMC is a board member of the Automation Federation. This year a decision was made to establish a curriculum for automation worldwide. We as the SAIMC, committed to define what process and factory automation is, and what the curriculum will entail.

If you have not had a look at the future positions published by the Automation Federation, I would urge you to go and browse on their website to see what the future holds. Academic institutions around the world are starting to use these guidelines to adapt and innovate. Employers should ensure that they are also adapting appropriately to these changes. Interestingly, social skills and collaboration will be a key requirement going forward, whilst most people would conclude that a world that is automated would not require these skills.

**DTI, NTIP and SAIMC Education Initiative**

The NTIP initiative is continuing. The main focus now is to establish the Automation Curriculum into an already successful programme within the NTIP framework. To ensure that your contribution as to what should be fostered into the Automation Programme is implemented, we call on your support to be part of this initiative. If you are not sure of the proposed changes in this exciting project, I would like to invite you again, to enquire with the SAIMC or if you want to participate in shaping the automation sector in the education sector in our Education and Training team led by Johan Maartens.

We need your contributions using your skills, and your passion coupled with your experience to make a difference. As an employer and also an employee, you now have a platform to make a difference in education that will be provided to your future colleagues and employees and ultimately enhance skills and prepare and lead our economy into the future automation technologies. Your contribution will ensure that industry and education are aligned.

The key to remember is that we are preparing for a change in industry and the skillsets required for the future are different. Everyone will be able to effectively adapt, especially the current working population. We just need to make sure that the correct input is given to ensure maximum opportunities are available.

I am very excited about the progress that Johan Maartens and his Education and Training team are making in this area along with the DTI and NTIP team. Thank you for all great your work!

Until I write to you again.

Good luck with the last couple of weeks of 2018 to all!

Yours in automation,

Annemarie van Coller.
Despite the arctic weather conditions, an impressive number of people came out to listen to Dr. Mathew Moodley (Senior lecturer at the School for Chemistry and Physics, Westville University of KZN) gave us some insight into the world of research into how new materials are being developed in ways that we would have considered impossible a few years ago. In his presentation, Dr. Moodley introduced the audience to this huge area of research called nanoscience and nanotechnology and explained why, on the nanoscale, the properties of materials we are all familiar with behave differently and have practical applications in modern devices such as solar cells, computer chips and chemical sensors. While the field of materials is huge, he focused the talk on his research area on his work on carbon and boron and gave examples of the different characteristics of their allotropes.

Mathew explained how a high-powered laser is being used in an ultra high vacuum chamber to deposit atomic thickness layers of materials onto a substrate in order to build up materials that can exhibit physical characteristics that differ according to the plane in which they are examined.

These new advances already play a massive role in our daily lives and can, when developed on a commercial scale, result in further exciting (and very profitable) opportunities. New developments in materials and deposition techniques have, in turn, enabled the development of many devices that we now take for granted.

It was a fascinating topic which was excellently presented and well received by those present.

Also attending Dr Moodley’s presentation were members of the new MUT Student Chapter which was formed by Prof. Ralph Naidoo. This chapter is a non-profit membership organisation dedicated to promoting professionalism among automation and control engineering students and is a student chapter affiliated with the Society of Automation, Instrumentation, Measurement and Control.
Annual high-tea
On 17 August, the branch hosted its third annual high-tea for ladies in the instrumentation and control field. Due to the high level of interest the event had to be moved to a bigger venue this year. Graceland Casino and Country club was chosen and the staff there assisted us in hosting our biggest and best high-tea to date.

The hall was beautifully decorated and upon arrival all of the tables were overflowing with delicious treats to suit the high-tea theme. This year the focus was on networking and what better way than including fun activities. SAIMC president Annemarie van Coller kicked-off the event by giving a recap of all the important activities that the SAIMC is driving and how anyone can get involved. Next Estelle van Staden gave a talk on the importance of coaching and mentoring in the industry, as well as in life.

Two of the highlights were the EDRO robot demonstration and a competition whereby each table had to program a robot to navigate itself through a maze, the team to complete the task first won the challenge.

The day was closed with a live cooking demonstration where executive chef Johan van Zyl taught the ladies how to fold and cook samosas and spring rolls, with different fillings. Each guest left with new friends, a smile and a take-away box full of delicious samosas and spring rolls to show off at home.

The branch thanks the following sponsors for making this event possible: Proconics, Beckhoff, Mundells Hairdressing, Rootz Boutique Spa @ Graceland and the Graceland Country club.
Tshwane branch

At the September technology evening, the branch was fortunate to have Bruce Bonte from Yokogawa present on ISA100.11A wireless technology. The presentation included topics such as an introduction to ISA100.11A, benefits of wireless and some case studies and application notes. The presentation is available, so interested parties feel free to enquire.

As always at technology meetings, colleagues and friends are welcome to attend and enjoy a cocktail with like-minded people united by the desire to be the best in the field of automation. For more information please contact any of the committee members.

Year-end function
(tentatively 21 November)
This will be held at Cheers in Irene, where we will go for a meal. The pub is excellent in terms of food and prices, with specials running as well. Please let us know if you are interested in attending as seating is limited to around 20, and will be on a first-come-first-served basis. Please RSVP by 16 November.

Johannesburg branch

At the last technology evening, hosted by Endress+Hauser, Frans van den Berg presented on Heartbeat Technology and Jenine Jansen van Vuuren spoke about calibration in conjunction with Heartbeat.

Heartbeat Technology provides diagnostics and verification without process interruptions to ensure cost-effective and safe plant operation during the entire life cycle. It combines diagnostic, verification and monitoring functions for process optimisation.

Heartbeat Monitoring minimises the probability of a sudden breakdown or failure of the measurement point, and helps define when maintenance may be needed. The benefits include sensor health trending, tracking the quality of calibrations and integrating a maintenance timer to ensure optimal sensor performance is delivered.

Heartbeat Verification permits a measurement point to be assessed in situ at any time, without removing the sensor or shutting down the process. This qualitative function checks the entire measurement loop, verifying sensor and transmitter performance. Verification results are provided via an audit report automatically generated by the transmitter.

Calibration in measurement technology and metrology is the comparison of measurement values delivered by a device under test with those of a calibration standard of known accuracy. Other points on calibration covered by Jenine included:

• How verification supports calibration.
• Calibration and ISO 17025.
• The custodians of metrology and standards in South Africa.
• Benefit of physical calibration.
• Possible disadvantages of physical calibration.
• The verification and calibration of flowmeters.
• How Heartbeat Verification supports calibration.
• Metrological traceability.

The branch thanks Frans and Jenine for their informative and well-received presentations.
System integrators

**Abacus Automation**
Abacus Automation supplies innovative, custom-developed technical solutions using standard PLCs, drives, scada and motion control equipment and is Siemens approved for crane automation. With 22 years in the industry, this award-winning and internationally acclaimed company has highly qualified, experienced and professional staff. It operates out of offices in KwaZulu-Natal.

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www.abacus-automation.co.za

**Afrilek**
As solution providers in the industry, Afrilek’s extensive skills encompass all aspects of electrical, control and instrumentation design; implementation and operation. The company provides complete automation and electrical solutions in projects, panel manufacturing, support and services, training as well as product distribution. Afrilek is a proud BBBEE, ISO 9001 and CIDB accredited company.

Tel: +27 11 372 9340
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www.afrilek.com

**Altech Alcom Matomo**
Altech Alcom Matomo specialises in the design and supply of turnkey communication systems such as wide area voice and data networks and scada/telemetry solutions, as well as user terminal supply and support. Backed up by highly experienced engineering, project management, systems integration and field engineering departments, these systems use products from the extensive Motorola network range.

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**Autotronix**
Autotronix is a recognised leader in industrial automation design and implementation having attained its ISO 9001 certification. Autotronix offers its clients turnkey control system integration services for energy management, PLC/HMI/SCADA/VSD, manufacture of control panels, applications for water distribution and manufacturing. The company operates from offices in Gauteng and KwaZulu-Natal.

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www.autotronix.co.za

**Control Software Solutions**
CSS is a proud Level 2, B-BBEE contributor which provides a wide range of solutions to its customers in the engineering and infrastructural environment. Its many awards from suppliers and clients testifies to its commitment to service excellence.

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**Hybrid Automation**
Hybrid Automation is an approved Siemens system integrator and partner for automation and drives, process instrumentation as well as motion control. This enables it to provide its clients with the latest technology and solutions. Its client base includes major blue chip companies and has gained a strong foothold in virtually all the engineering verticals.

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**Iritron**
Iritron is a new millennium technology company providing quality solutions in the fields of electrical instrumentation and control systems engineering, systems integration and simulations. It has a proven ability to manage projects efficiently and produce high quality results. It has an extensive track record of successfully implementing plant infrastructure reticulation, designs, and automation and information systems. Iritron, a TUV accredited ISO 9001:2008 technology company, is able to offer its clients PLC, DCS and Scada software and hardware, as well as electrical and instrumentation design, engineering, project management and commissioning services.

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**Moore Process Controls**
Moore Process Controls provides process automation and optimisation solutions to realise the maximum potential of your plant and assets. Our offerings include DCS, PLC, scada, compressor control solutions, MES, production management and predictive maintenance systems, control loop optimisation, alarm and energy management systems, plant security and access management systems, Matrikon OPC, Osi Soft, dashboards and historians, wireless and data solutions including digital twin, process simulators and training simulators and cloud-based IIoT solutions.

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SYSTEM INTEGRATORS

Process Dynamics
Process Dynamics specialises in industrial automation and process control. The company is one of Africa’s leaders in turnkey automation projects and specialises in the integration of scada (WinCC, PCS7, Wonderware, Citect) and PLC (Siemens, Schneider, Rockwell) as well as MCC and control panel manufacturing and installation. Process Dynamics is ISO 9001:2015 accredited as well as a registered CIDB company.

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SAM – Systems Automation and Management
Systems Automation and Management is a supplier of data acquisition systems and innovative automation solutions and is one of the leading integrators of PLC, scada and fieldbus systems in South Africa. The company’s comprehensive range of capabilities includes industrial networks, automation and control, scada, custom solutions, information delivery, data warehousing, hardware and software, BMS, MIS and MES.

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PSY International
PSY International specialises in industrial automation and process control. As an approved ABB Authorised Value Provider for softstarters, VSDs and UMCs, it guarantees supply of high quality and technologically advanced products for energy measurement and monitoring. Its core competencies include system integration; control panel building and commissioning; automation design and supply; maintenance and breakdown service; PLC and scada software development and building management systems.

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Saryx Engineering Group
Saryx Engineering Services offers complete solutions to optimise plant-wide process control and enable operational excellence and focuses on industries that require continuous control for complex, business critical operations, including mining, metals & mineral processing, chemicals, utilities/ water, but is equally comfortable with smaller non-critical projects.

Tel: 086 099 5105
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Laura: +27 11 543 5806 | laura@technews.co.za

www.instrumentation.co.za November 2018 19
End-to-end system integration from Hybrid Automation

Hybrid Automation, an engineering solutions company, was started in October 2005 by member Sachin Singh in response to the need for a Siemens systems integrator. The company’s workshop and office is situated in the hub of Briardene Industrial Park on Queen Nandi Drive, Durban, and employs project management, software engineering, instrumentation, electrical, installation, procurement and the finance teams.

This privately-owned business is personally supervised and managed by Singh, who also oversees the daily operations of the business. The company follows global industry trends and is renowned for its diversity, flexibility and efficient utilisation of cutting-edge technology.

As an approved Siemens systems integrator, Hybrid Automation is authorised to backup all Siemens automation, drives, process instrumentation and motion control equipment in an efficient and professional manner. “Our knowledge of robotics has allowed us to incorporate the use of cobots (collaborative robots) in the production environment,” explains Singh. “In addition, we supply and support any Siemens industry automation and process instrumentation products, such as PLCs, motors, drives, switchgear and field equipment. We also offer clients a range of world-class technology products, such as consumer IT electronics, electrical and related equipment, underpinned by our technical expertise.”

Hybrid Automation is a level 1 BEE Contributor with a 100% ownership and is also registered with the Central Supplier Database (CSD) and the CIDB with a 5EP designation.

Singh points out that due to its competent and proactive business approach, it has been able to acquire and maintain a high-end client base, consisting mainly of blue-chip companies in Africa. A number of projects recently completed include the upgrade of an ice cream forming and packing line; end-of-line solutions using a Cobot for pick-and-place; case packing using a robot palletiser; oven plant electrical and burner automation; historian of temperature, humidity and running recipe trending; and water handling systems for factory utilisation.

The company’s list of services is extensive and includes PLC and HMI software development, scada development and reporting, automation design consultation, integration of shop floor to MES for production control and monitoring, automated scada reporting from WINCC to Excel, Totally Integrated Automation (TIA), and the Industrial Internet of Things (IIoT).

For more information contact Sachin Singh, Hybrid Automation, +27 31 573 2795, sachins@hybridautomation.co.za, www.hybridautomation.co.za
Japan reopens nuclear power plants while progress is slow elsewhere

The Fukushima nuclear power plant accident occurred back in March 2011. Following that disaster, Japan ordered the close-down of all the nuclear generating plants in the country – there were 42 of them, previously providing a major part (over 30%) of the domestic electricity supply. Historically, Japan had used nuclear, coal and LNG power plants, and very little oil. The accident resulted in an enormous increase in imports of coal and LNG – the latter leading to an acceleration of LNG production.

A major part of the response planning over a term is taken to mean ‘Small Modular Reactor’, and includes many of these current operational units. Together IAEA referred to them as ‘small and medium reactors’ (SMRs): but now the term is taken to mean ‘Small Modular Reactor’, and currently many of these are designed for around a 50 MW output. Multiple SMRs can be grouped on one facility.

In the USA, the NuScale Power design certification for their SMR project, to be adopted first by Utah Associated Municipal Power Systems, has been completed by the NRC. Utah AMPS is planning a 12-module SMR plant in Idaho, scheduled for operation by 2025, and forecasting an output cost of $65 per MWh, which is comparable with other renewable technology generation price forecasts. The market for SMRs is seen in brownfield sites – the sites of decommissioned (coal fired) power plants, where the power unit size averages 125 MW.

The UK has plans to add SMR plants, and the government even has (presumably) awarded the £44 million promised to support a ‘two-phase advanced modular reactor’ development, for which it received 20 bids earlier this year. NuScale has expressed strong interest, and Rolls-Royce is promoting its detailed design for a 220 MW SMR unit. Rolls-Royce has designed three generations of small medium naval reactors since the 1950s.

In South Africa, two projects are known to have considered the use of modern HTR, high temperature gas cooled reactor designs, the PBMR (pebble bed modular reactor) project, led by Eskom (165 MW), and the HTMR (35 MW): the PBMR project is believed to be currently on hold. This type of reactor design is of major interest around the world, and October 2018 sees another of the biennial conferences on the topic in Warsaw, Poland.

Nick Denbow’s European report

Nick Denbow spent thirty years as a UK-based process instrumentation marketing manager, and then changed sides – becoming a freelance editor and starting Processingtalk.com. Avoiding retirement, he published the INSIDER automation newsletter for 5 years, and then acted as their European correspondent. He is now a freelance Automation and Control reporter and newsletter publisher, with a blog on www.nickdenbow.com
First rack-mounted switches that comply with the IEC 61850-3 Edition 2 Class 2 Standard

In today’s industrial processing environment, industrial Ethernet has become a de-facto standard to connect to the company’s PLCs in manufacturing, IEDs in substations and cameras for CCTV, in harsh environments. All of these demand ruggedised networking switches to ensure stable communications to the company’s SCADA, ERP and MES software. Often, industrial networking products are installed in and around the production areas where they are subjected to high temperatures, vibrations and electrical noise from VSDs and motors.

Moxa has launched the world’s first rack-mounted Layer 2/Layer 3 managed switches, PT-G7828/G7728, that comply with IEC 61850-3 Edition 2 Class 2 and IEEE 1613 Class 2. The switches’ 28 ports all support full Gigabit hardware time-stamping as defined in IEEE 1588v2. In addition, the switches offer selectable RJ45/SFP/PoE+ interfaces and dual LV24 – 48 VDC/HV-110 – 230 AC-DC power modules to ensure suitability for a variety of applications.

The IEC 61850-3 Edition 2 has been developed over many years based on feedback from deployments in substations. Adherence to this latest standard ensures that devices are rugged enough to be deployed in the harshest environments including substations, mines, rail, ITS, oil and gas, and other heavy industries. In addition, compliance with Class 2 of the Edition 2 standard ensures that if the device is subjected to high levels of EMI, shock, or vibrations, data will still be successfully transmitted.

The leading causes of unscheduled network downtime, as sourced by Gartner, can be attributed to the technology implemented and the hardware selected. Their research showed that 20% of network downtime is due to hardware. It is therefore imperative that a customer selects the best-in-class hardware, and takes into consideration quality and MTBF.
(mean time before failure) of the product, including power failure of the product itself. More considerations include links and designs, including misconfigurations of link technology or protocol, and no network redundancy design to avoid a single point of failure. Environmental design should also be considered with regards to temperature, humidity, dust, etc. EMS interference may also cause a network to react in an unstable manner. By carefully considering the above factors, customers can ensure that their OEE (overall equipment efficiency) of the network is optimised.

The PT-G7828/G7728 switch remains a fanless, ruggedised industrial Ethernet switch that can also be deployed for CCTV application in harsh environments. It can support up to 24 POE + ports, making it versatile and able to work in various applications. The PT-G7828/G7728 is also fully compliant with all industrial protocols, such as Profinet, EtherNet IP and Modbus TCP, ensuring seamless integration into your existing industrial network. In addition to this, it also supports a built-in MMS server, and IEC-610-90-4 switch data modelling for power scada applications. The PT-G7828/ G7728 comes with Moxa’s latest firmware, Turbopack 3, which includes exciting new features for both Layer 2 and Layer 3 networking. Part of the latest firmware is Moxa’s network tracking system which was developed for a double-ring, double-stacked, high availability and multi-recovery network, allowing numerous points of failure on the network while still being able to connect to field devices. The switch comes standard with Moxa’s famous Turbo Ring and Turbo Chain which has been enhanced, and allows ports to be truncated for higher backbone communications.

“The switches were built to simplify complex network integration and scalability.”

Utility timing synchronisation
All ports support hardware time-stamping synchronisation that has been defined in the IEEE 1588v2 standard, which ensures that the PT-G7828/G7728 switches deliver time-aligned data transmission. In order to ensure interoperability for the PTP function across products from different vendors, Moxa’s products have been verified by the UCAIug Interoperability Test. Furthermore, to meet time accuracy requirement in power system applications, the devices support the IEEE C37.238 power profile.

Hot-swappable maintenance and a modular design
The PT-G7828/G7728 switches were built to simplify complex network integration and scalability. In order to achieve this, they have a unique modular architecture, including four fixed Gigabit ports, six quad-port Gigabit module slots, and two power module slots, to ensure sufficient flexibility for a variety of applications. The hot swappable function supports easy maintenance by allowing power and media modules to be replaced without having to shut down the system or impacting other communications that pass through the switch.

This allows Moxa customers to easily upgrade and enhance the switch capability by adding or removing a module while the network is in operation. Furthermore, as the switch supports dual hot-swap power supplies, even in the event that a power supply is damaged by a power surge, it could be replaced without having to recycle the power on the switch.

GOOSE monitoring to facilitate preventive maintenance
To speed up troubleshooting, the PT-G7828/ G7728 can act as an event recorder to perform GOOSE monitoring and inspect all messages between IEDs. The switches can also keep the power scada or NMS systems informed on the communication status of GOOSE messages. The monitoring feature allows possible problems to be identified at an early stage and also allows operators to know exactly where the problems are occurring. These features accelerate problem detection and help to prevent failures and loss of communications in the future. This switch has been designed for 24/7 availability and 99.9% uptime.

For more information contact RJ Connect, +27 11 781 0777, info@rjconnect.co.za, www.rjconnect.co.za
Environmental challenges in the mining industry

South Africa’s economy is greatly dependent on the mining sector for its growth. The country is the largest producer of chrome, manganese, platinum and vanadium, as well as the largest exporter of coal globally.

Mining opportunities are mainly located inland and not necessarily close to rivers or other water sources. However, the mining process is water intensive and it is no secret that South Africa is a water scarce country – rated as the 29th driest country out of 193. This is difficult to manage due to variable rainfall, and the uneven distribution of water throughout the country with water is often not available where it is required.

To alleviate these shortages in catchment areas, large inter-catchment transfer schemes were implemented, but these have negatively impacted the water quality in some basins: for example: the rise of salinity in the Vaal and Orange systems. The management of ground water has also been lacking, which has resulted in over abstraction as well as widespread pollution. One source of this pollution has been identified as mining activities. Water-pollution problems caused by mining include acid mine drainage, metal contamination and increased sediment levels in streams. Sources can include active or abandoned surface and underground mines, processing plants, waste disposal areas, haulage roads or tailings ponds.

A matter of concern is the serious water quality problem in the Olifants River catchment area. These localised problems need to be addressed by compliance monitoring and enforcement, as well as reducing pollution at source. This can only reliably be achieved by monitoring the water management plans of the mines, along with continuous measurement of water quality parameters in surrounding surface and ground water reserves. Mines can prevent untreated or insufficiently treated water being released by continuous monitoring of their effluent quality.

The Endress+Hauser solution

With Endress+Hauser’s wide range of water quality measurement instruments combined with communication gateways for remote access, complete compact monitoring solutions can be supplied to the industry. Two innovative embedded technologies improve the reliability of these solutions: Memosens and Heartbeat Technology.

Memosens

Memosens technology provides digital communication between sensor and transmitter and transfers data to and from the sensor via contactless induction technology. This eliminates problems previously experienced with corrosion or moisture ingress in connectors. Process safety is therefore improved and downtime reduced. All information is stored in the sensor and communicated to the transmitter when connected. The data available from the sensor also allows for more accurate predictive maintenance. For mines, serious about reliable water quality measurements, a streamlined and predictive maintenance regime using Memosens will ensure accurate and reliable measurements are always protecting the environment.

Heartbeat Technology

Heartbeat Technology in measurement devices organises clear, standardised diagnostic messages to maintain the plant based on necessities. It enables predictive maintenance and delivers evidence for operational reliability and process safety. As the devices run their own diagnostics, proof tests are only necessary in maximum extended cycles. Users can verify and document each measuring point without interruption of the process. This process and device data identifies trends and the parameters available facilitate analysis for predictive maintenance. Using Heartbeat and monitoring it remotely increases uptime as indication of deterioration or failure of an instrument will be immediately highlighted to the maintenance team. This ensures more accurate data to prove compliance of the mine to its water use licence and other environmental laws. Heartbeat Technology is also available on new Proline flowmeters and Micropilot radar instruments.

By always ensuring the quality of the treated effluent complies to regulations and parameters set out in the water use licence, the strain on this scarce resource can be minimised and water sources preserved for future generations.

For more information contact Hennie Pretorius, Endress+Hauser, +27 11 262 8000, hennie.pretorius@za.endress.com, www.za.endress.com
NO TIME FOR DOWNTIME?

In your tireless campaign to perfect operational efficiencies, BMG stands out as the partner who can truly make a difference. Supported by the world’s premium manufacturers, BMG’s considerable product and service offering continues to evolve and boost productivity in mining across the continent.

For more information contact your nearest BMG branch.
In the current economic climate, most companies are looking to make their Rands go further. This is especially the case when it comes to fuel, as modern industries cannot operate without it and diesel costs continue to rise.

Fuel and lubricants are the lifeblood of the mining industry, which rely on them to ensure continuous operations. They are also one of the biggest expenses on a mine, so the way in which a mine purchases, stores, manages and uses these products can make an enormous difference to the bottom line. Effective fuel and lubricant management can help mines reduce their operating costs, increase their productivity and reduce environmental risks.

Large mining vehicles can easily consume a lot of fuel. A good example is a mining haul truck’s average consumption rate. On the normal gradients of 10% found on a mine haul road, and with a typical payload of 182 t, the vehicle goes through approximately 350 litres of diesel an hour. This goes up dramatically if the driver speeds or puts the vehicle under additional stress. Thus a Cat 793F mining truck with a fuel tank capacity of 2839 litres will operate for approximately 8 hours before it needs to be refuelled.

Depending on the remoteness of the operation, mining companies can lose several days of production through waiting for fuel to be delivered to site. Therefore, many mine sites require fuel and lubricant bulk storage in order not to halt operations. Monitoring of these inventories, purchases and usage then becomes crucial to assist management make well-informed decisions; many mines still do not have access to the right information.

For effective decision making, the availability of high-quality online and real-time data is essential. Endress+Hauser offers an inventory management solution with accurate, safe and reliable measurement through high-quality products precisely designed to meet customer requirements. The solution includes a level measurement that can use a servo gauge (Endress+Hauser Proservo NMS80) with an accuracy of 0.4 mm. It also includes temperature measurement (Endress+Hauser Prothermo NMT 530), a unique device used for compensation for temperature, having multiple temperature measurement points across the entire height of a tank. An additional benefit of Prothermo is that it can also detect water in a fuel storage tank.

Safety
Safety is an important issue at mining sites. Handling of fuels incorrectly on sites can cause harm to the environment (or worse), especially if tanks are overfilled resulting in a spillage. Endress+Hauser offers a complete overfill prevention solution certified according to IEC 61511 by independent safety experts. An automated proof test guarantees that the safety system functions properly: proof-testing of 16 tanks takes less than 5 minutes.

The solution described forms an integral tool for decision making with regards to effective fuel management:
• The load metering solution assists with accurate metering and quality to identify water in the fuel.
• The inventory management solution assists with effective storage management.
• The overfill prevention system assists with safety in fuel handling.

For more information contact
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Having an in-house projects department to focus on the specific requirements of project houses, OEMs and other tender-related project activity is starting to bear fruit for drive and automation specialist SEW-Eurodrive South Africa, which has clinched an order for five M-Series industrial gear units for a mining operation in West Africa.

The department, headed by Andreas Meid and with Pat Marquez as project sales coordinator and Brett Weinmann in charge of project sales development, oversaw this entire venture from receipt of the initial order to successful installation and commissioning at the mine, in addition to any back-up service and technical assistance required.

It is this capability to offer complete solutions, as opposed to standalone products, in addition to the necessary aftermarket support, that has resulted in SEW's projects division showing consistent growth year-on-year. “We pride ourselves on our on-time delivery, which is a clear differentiator for us in a highly competitive market,” comments Meid. “We are committed to supplying high-quality products, in addition to the continuous improvement of our customer service offering.”

The department also has a drawing office and a mechanical engineer to compile any calculations that are needed. Its core function is to respond to queries from either project houses or OEMs for specific project work. It focuses mainly on greenfield projects related to conveyors, agitators, and mixers in mineral-processing applications.

“Based on the enquiries received, we work in conjunction with the specific project house or OEM to offer a complete solution for their mining clients,” explains Meid. “In other words, our products essentially allow them to complete their portion of the work in hand.” Such collaboration between suppliers and related companies is a growing trend in response to a tough business environment, and the customer requirement to reduce operating costs by installing the latest technology.

**Project management is critical**

The team liaise closely with their clients in order to best meet all technical requirements and time constraints. “Project management in this regard is critical, from the time that the order enters our system, to the point where the product is finally delivered,” elaborates Marquez. “Once this stage is reached, other departments also become involved.”

“We specialise in integrated solutions,” adds Meid. “Many clients tend to regard SEW solely as a gear unit supplier, but we offer a host of ancillary services that can add significant value, reduce risk and downtime, and improve efficiency. This is why the projects department remains in a growth phase, with the bulk of its work being secured in the rest of Africa at present.

In this regard, it also works closely with the Exports Department, headed by Marcio Sicchiero, to realise additional opportunities on the continent.

**M-Series industrial gear units**

In terms of main products, the M-Series industrial gear units (the M indicating modular) are ideal to meet the highest demands for quality, reliability, and performance. The product range has been optimised for a range of drive characteristics, allowing for simple machine design by easily adding options and mounting parts.

A long service life is guaranteed due to highly efficient lubrication and sealing, which also cuts down on maintenance requirements. Easy mounting and installation are facilitated by advanced features such as EBD (extended bearing distance) and an axial thrust bearing arrangement on the output shaft.

Looking to the future, Meid concludes that the company is well on its way to being perceived as a sole solutions provider for its clients: “This gives us the added possibility of integrating some of our latest electronics products as well in future. While our mechanical products remain our core focus, particularly given the harsh operating environment in Africa, combined with the lack of technical skills, SEW-Eurodrive has always been sufficiently forward thinking to make sure clients have access to the latest technology and developments.”

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Electra Mining Africa 2018: a platform for our future in mining

By Norman Maleka, national sales manager, SEW-Eurodrive.

Our focus at this year’s Electra Mining was to showcase the new products we are developing for the future. SEW is present in all major industries, from mining to food-and-beverage and automotive, to name a few. Hence it is always a challenge for us when it comes to Electra Mining: What do we focus on? Which products do we push aggressively? It is an interesting challenge, because it implies we have a range of solutions for different industries.

The biggest industry for us is mining. How do we approach the issue of providing solutions? We deal mainly with project houses, as these are actively involved in many new mining projects. We also deal with OEMs who tender to produce solutions.

A full portfolio of solutions

As in previous years, we had our full mining product portfolio on our stand, including our large geared and industrial gear (IG) units. These are vital for applications such as conveying and hoisting, which require large heavy-duty units. However, mining operations consume a lot of energy, so we also demonstrated our energy-saving initiatives.

These included the application of VSDs for motor control, and we even had specialised products such as our LTP-B Eco HVAC drive. This can extract dust or circulate clean air in a shaft. It can pump out slurry water, or even pump in water for cooling applications. It is a new product for us, which is why it was at the forefront at Electra Mining Africa 2018.

We even had specific products for materials handling in mining, such as our AGV system. This is used to automate in-house material flows, or can serve as the basis for flexible assembly operations. The track-guided inductive heavy-load AGVS allows for a barrier-free factory, for example.

SEW’s total AGV system solution covers the individual vehicles, energy supply and the WLAN communication, as well as the navigation and vehicle coordination itself.

Yes, mining tends to shy away from sophisticated technology, and has always relied on manual labour. The uptake of automation has been slow because it is such a difficult operating environment. Any equipment installed has to be sufficiently rugged and durable to withstand these conditions. This is why we also focus on solutions specifically for mineral-processing plants, which has a greater demand for new technology.

A showcase for competency

Electra Mining Africa is an important opportunity for us to showcase our competencies. We have always perceived the exhibition as a major platform to realise this goal, and to reach a far bigger audience to communicate our product portfolio to. We are also able to inform this audience how we have evolved, not only from a product point of view, but also in terms of the ancillary services we have added to the business.

For us, it is one platform we never miss. We always look forward to it. It gives us an opportunity to engage with our customers, and to learn about the market – not only to benefit our customers, but also for us to learn about the competition, and what is happening at the coalface, so to speak. It is a perfect platform for networking, for promoting technology, and showcasing the evolution of our company, as an innovator, a solutions provider, and as an essential partner to the mining industry.

For instance, an emerging trend is our mechatronic industrial gear (MIG) units. These represent the convergence of gears, motors, and decentralised inverters in a single handy package. This is an exciting future technology for the mining industry, especially with the increasing trend towards automation to cut costs and boost productivity.

This is the ‘future of mining’ as SEW sees it developing. The message we put out is that we were there to listen to our customers and develop products in response to their needs, from energy-saving to automation.

Clearly the mining environment needs to play catch-up, and we were able to inform the industry of the quickest and most practical means of doing this. However, it is always a two-way street. For me, one of the most exciting aspects of the exhibition was to be able to interact with delegates who asked questions and presented us with their specific problems or issues. Some of these questions we might not otherwise have thought of, or they highlight different application requirements.

This is the kind of information that is invaluable to us as a supplier. It allows our research and development department to develop products to solve a problem or to meet a need. You have to understand your customers and their challenges? Even though you might have come up with a solution, how effective is it in the field? Such feedback is invaluable.

A platform for interaction and discussion

So for us Electra Mining Africa is not only a product showcase, it is a platform for interaction and discussion. Not only does it serve South Africans, but it sees delegates attend from all over the world, and from different mining environments or application areas. This is an invaluable source of feedback from a broad spectrum of end users. Our aim is to spark a discussion, debate, or a conversation around our products. In so doing, we better understand their requirements, how to service them better and, ultimately, how best to improve our products.

It is difficult to sell technology from a brochure. If customers cannot see it, then they cannot comprehend the practical benefits and advantages. Seeing our broader product portfolio on the stand made customers aware of what else we can offer, and the possibilities of integrating new technology and solutions into existing operations. So if somebody asks me if there is value in participating in Electra Mining Africa, my answer is of course. Some of the opportunities might not be realised immediately, but it does mean we can sow the seeds that will lead to future orders. Our product
Siemens showcases solutions for mining digitalisation

Technologies are available today to help mining companies increase digitalisation and tackle the challenges facing their industry. Digitalisation brings together every idea, every process, every machine, every stakeholder and every eventuality to ultimately form a unified digital enterprise. At Electra Mining 2018, Siemens presented its full suite of digitalisation solutions tailored to the needs and challenges of the southern African mining industry.

The interactive stand was designed to simulate an underground environment and covered the four phases of the Siemens digitalisation process: design and engineering, automation and operation, maintenance and services, and electrification. Highlights included:

- The engineering and plant management software, Comos, which enables the complete digital planning of all major disciplines on a plant.
- A virtual reality experience, Comos Walkinside, showing how plant data can be visualised in 3D through a virtual tour around the plant.
- The cloud-based, open IIoT operating system, Mindsphere, which connects products, plants, systems and machines, enabling customers to harness and share the wealth of data generated by IIoT with advanced analytics.
- The operations intelligence software, XHQ, which collects, aggregates and condenses plant, process and business data in real time and gets it to decision makers to make fast decisions based on real facts and figures.
- The TIA Portal Cloud Connector, which serves as a communication tunnel and enables central management of engineering software.

Ralf Leinen, vice president of Digital Factory and Process Industries and Drives, Siemens Southern and Eastern Africa, said that modern mining houses need to stay relevant in the next fifty years in a challenging environment. Key drivers in the industry are health and safety, going deeper to get the ore grades, and capex issues. They understand the need for digital transformation and are embracing this new technology, which can help them improve productivity and engineer out risk at the stage when operations are being designed.

Simulation and training

“Comos is an environment where you can virtually design, develop, engineer and test the operations on a mine to create a 3D model, the digital twin. The whole mining operation is simulated in the virtual world before going live,” he explained. “Information is then fed back from the live operations to the virtual twin in a continuous cycle to further develop and improve the process. We are combining and integrating the virtual world with the real world. This is why we call it integrated engineering to integrated operation.”

He added that with Comos Walkinside you get complete virtual replication of a plant. This allows operators to be trained safely on high value equipment in a 3D virtual world, as if they were on a real plant – for example, shutting down a plant. Much more than a programming tool, Walkinside is an environment for educating and upskilling personnel.

Then there is Comos MRO for maintenance and reliability in operations, so a new technician on site can be trained in a virtual world. It gives visual instructions on how to execute the task at hand, whether it be inspection, maintenance or upgrading, and all the information generated is stored in Comos.

This is backed by Mindsphere, a platform for information sharing information that allows users to extract data from machinery, distil it into meaningful information, and share it over the web – mine performance for example. There is a whole ecosystem of developers all contributing and sharing these value added apps – all totally open.

“With our integrated approach, solutions for the digitalisation of plants and processes and industry expertise, we can help improve overall plant performance and secure long-term competitiveness,” concluded Leinen.

“This includes connecting the virtual with the real world, addressing core elements such as plant life cycle management, plant design and engineering, process simulation and digital twinning, virtual commissioning, automation and operations, maintenance and services, and finally, closing the loop by feeding data analytics back into the plant model for continuous improvement.”

For more information contact Jana Klut, SEW-Eurodrive, +27 11 248 7000, jklut@sew.co.za, www.sew-eurodrive.co.za
The application of very low frequency (VLF) technology in the development of underground safety equipment is an important step towards achieving the mining sector’s objective of zero harm, according to Booyco Electronics engineer and developer, Frank Schommer.

Booyco Electronics began developing collision warning systems over 12 years ago, using VLF technology to build a proximity detection system (PDS) for underground mines and becoming a pioneer in this complex field. "VLF," says Schommer, “is used to generate a magnetic field around a vehicle, essentially a ‘fence’ that is independent of the material present in the immediate vicinity.

In other words, VLF technology allows this magnetic field to travel through obstacles like rock and water, maintaining the fence at a constant distance from the vehicle. This means that the shape of the field around the vehicle remains exactly the same, whether the vehicle is underground or on surface.

Due to their frequency, the waves are not reflected by walls or other elements of the environment, rather they penetrate these objects. What is vital is that the corners and crossings in an underground haulage have no effect on the shape and size of the magnetic field around the vehicle, as the waves will penetrate the rock walls and other obstructions that limit what operators and pedestrians can see.

“If the pedestrian is behind another vehicle, for example, or behind a corner in the tunnel, the proximity detection system must be able to pick up and pinpoint their position,” explains Schommer. “This is what VLF allows us to accomplish so effectively with our PDS solution.”

However, despite the advantageous characteristics of VLF waves, it is still a challenging process to create a magnetic field to the exacting specifications demanded by safety applications. It requires high levels of power in the transmission antenna to generate the field, for instance, and even in the receiver as well.

Schommer emphasises that PDS, when applied in the sphere of worker safety underground, must ensure absolute stability of conditions so that the performance of the technology can always be relied upon to operate optimally.

“That is the reason why we have used VLF technology as a basis for our solutions,” he adds, “as these waves are best able to deal with the reflective environment in underground workings and maintain fields of a constant size or distance from the source.”

Booyco Electronics’ innovations have leveraged VLF technology to provide valuable functionality for mine safety initiatives. Among the most important of these is the creation of detection zones within the magnetic field around a vehicle, which trigger specific operator warnings and subsequent actions.

“Our technology allows us to define the accuracy of these zones to within very low deviation tolerances,” says Schommer. “For instance, our first zone of safety may be 20 metres from the moving vehicle, and this is accurate to within 10 centimetres.”

When a miner – equipped with a VLF receiver and buzzer unit – enters this zone, the system sends a warning through a flashing light and a buzzer, to warn them that they are entering a dangerous area. Importantly, the behaviour of the VLF waves will allow the miner to be alerted even if they are behind a corner or otherwise out of sight of the vehicle operator, when within the detection range.

A second zone, closer to the vehicle, is also set up in the PDS to warn the vehicle operator that there is a pedestrian in the proximity. If the pedestrian does not respond to the warnings and gets even closer, they will enter a third zone which could now trigger mechanical intervention, for instance, switching the vehicle automatically to creep mode.

Should the pedestrian enter the last zone defined by the PDS – even closer to the vehicle – then a second intervention comes into play, stopping the machine in its tracks to avoid any possible collision or injury.

For more information contact Anton Lourens, Booyco Electronics, 086 126 6926, anton@booyco-electronics.co.za, www.booyco-electronics.co.za
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In coal-fired power plants, steam is produced by pumping highly purified water through boiler tubes. The water is heated to a high temperature and pressure, and then flows through several orifices into the steam turbine. Once past the orifice, the water pressure drops and it immediately flashes into superheated steam, which is directed toward the turbine blades at high velocity. Due to the high velocity of the superheated steam, the turbine blades start to rotate and turn the turbine shaft, which is connected to the generator through reduction gears, and thereby ultimately generates electricity.

Valve position, pressure and temperature measurements are all necessary to ensure stability in this process. A solution for this application is a setup with a potentiometer for valve position measurement, a 2-wire style pressure transmitter and a 4-wire RTD for precise temperature measurements. All three signals are connected to individual PR Electronics PR 4114 universal transmitters, which output 0-10 VDC signals to the PLC.

The 4501 display/programming front allows local readout of both input and output signal and the process calibration function in the advanced menu provides easy and precise calibration of the open and closed valve positions.

For more information contact WIKA Instruments, +27 11 621 0000, sales.za@wika.com, www.wika.co.za

Cables for the direct current era

Alternating current is the blood that flows through the veins of most power grids. It conveys electrical energy across great distances from the power station to factories and homes. But the monopoly of alternating current is coming to an end. Consumers such as mobile phone chargers, LED lamps and electric vehicle batteries increasingly require direct current. There is also an increasing number of power generators that supply direct current instead of alternating current, such as photovoltaic units. The necessary conversion between alternating and direct current consumes large amounts of energy. That is why energy experts are campaigning for the construction of direct-current grids. The industrial sector, especially the automotive industry, has also begun to equip factories to run on direct current. But there is a problem: direct current places new demands on infrastructure, including cables.

The first series cable for direct current

Leading connection systems manufacturer Lapp has taken a close look at these challenges and the company is due to showcase its first series product at SPS IPC Drives 2018. The Ölflex DC 100 is specially developed for supplying motors and systems with direct current. The cable is the result of comprehensive experiments in the Lapp laboratory and at the Ilmenau University of Technology, where Prof. Frank Berger researches the influence of direct current on the ageing process in cables. “In principle, cables for alternating current can also be used for direct current”, he explains.

In terms of long-term durability, however, there are still many open questions and very little in the way of knowledge, even though direct current has been around since the 19th century. Researchers have found evidence that direct current fields place different strains on the plastic of the insulation than alternating current fields. “It is very important to precisely understand this correlation, which is why we are paying so much attention to this issue, which will shape the future,” says Guido Ege, head of product development at Lapp.

Similar, but not identical

The new Ölflex DC 100 is designed to withstand decades of use with direct current, just like its alternating current equivalent the Ölflex Classic 100. The two cables feature different insulation, but otherwise share similar properties. They both have PVC sheaths and offer identical dielectric strength, for example. The only visible difference can be seen once the sheath is removed. The colour coding of the wires is different: red, white and green/yellow according to the standard DIN EN 60445 (VDE 0197):2018-02 that was updated in February 2018. The Ölflex DC 100 is available now.

For more information contact Lapp Group Southern Africa, +27 11 201 3200, info@lappgroup.co.za, www.lappgroup.co.za
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Swiss manufacturer LEM has released its new traction catalogue describing railway current and voltage transducers. The new catalogue outlines the various technologies used by an isolated transducer design, namely open-loop ‘Hall’, closed-loop ‘Hall’ and closed-loop fluxgate. Voltage transducers are based on closed-loop ‘Hall’ or new isolated digital technology, offering higher specifications.

The company provides transducers suitable for on-board rolling stock, for example, main rectifier, main inverter or drive propulsion inverter, auxiliary inverter. Trackside substation transducers are also available for rectifiers, DC switch-gear as well as DC energy monitoring. Also catered for are interference frequency detection, main transformer saturation detection, fault detection and ground leakage. The traction transducers are also suitable for mining trucks, trolley buses, subway railways and points machine monitoring.

LEM transducers carry a five year warranty and comply with European standards and regulations:

- EN 50463-x (2012): Railway application, Energy measurement on board trains, DC measurement Class 2 and AC measurement Class 1.5.
- ENS0155 (2007): Railway applications, Electronic equipment used on rolling stock.

Smooth-running services as well as passenger and employee safety in railway operations depend on functions such as emergency shutdown in the event of short circuits, the detection of delayed potentials and safe signal transmission. Therefore, transducers for railway applications must meet the highest standards of reliability and precision. For Knick Elektronische Messgeräte, this has been the cornerstone in the development and manufacturing of highly available transducers and signal conditioners over several decades.

At the 2018 InnoTrans exhibition, Knick showcased its transducers for traction power substations as well as new products for use on rolling stock: the SIL-2-compliant P16000 pulse frequency conditioner converts pulse signals from speed encoders into galvanically isolated analog 0/4-20 mA or 0-10 V standard signals required by control systems and substations to detect the travel speed. The transducer’s signal input is designed according to the SIL 2 safety integrity level to ensure that there can be no inadvertent impact on the signal source. The ability to separate the encoder signal and make it available for other applications eliminates the need to install additional encoders on vehicle axles.

Another highlight is the new ProLine P 50000 transducer series for high-precision energy measurement according to EN 50463. This series enables current and voltage measurement in traction inverters and auxiliary converters, and short-circuit detection in protective devices. These are the only devices in their class featuring calibrated range selection, which enables high flexibility in selecting input voltages in the 4200 V range, or currents in the kA range. After range selection, the transducers meet the high specified accuracy without renewed calibration. As the latest addition to the P 50000 series, Knick presented the P 52000 VPD voltage detector for reliable detection of voltages up to 4200 V. The detector compares the input signal with a selected threshold value that can be set at the unit. If, irrespective of positive or negative polarity, the threshold is breached, the detector displays an optical alert and generates an output signal that can activate or control hardware relays, protective devices or controllers. The signal level is matched to type 1 PLC signal inputs according to EN 6131-2. All products are fully compliant with applicable railway standards and comply with demanding requirements regarding fire protection, electrical safety, mechanical robustness, resilience to extreme climatic conditions and low EMI susceptibility.

For more information contact Denver Technical Products, +27 11 626 2023, denvertch@pixie.co.za, www.denver-tech.co.za

For more information contact Mecosa, +27 11 257 6100, measure@mecosa.co.za, www.mecosa.co.za
Yokogawa has announced the availability of the GX90XA-10-V1 high-voltage analog input module. This new product has been released as part of the OpreX Data Acquisition family of data collection and control solutions. The GX90XA-10-V1 module enables Yokogawa recorders and data-loggers to be used in performance evaluation tests for the development and production of electric vehicles (EVs), fuel-cell vehicles (FCVs), and plug-in hybrid vehicles (PHVs), as well as the on-board batteries used in such vehicles. Such tests typically require the measurement of multiple channels under high-voltage conditions.

Recorders and data acquisition systems (data-loggers) are used on production lines and at product development facilities to acquire, display, and record data on temperature, voltage, current, flow rate, pressure and other variables. Yokogawa offers recorders and data acquisition system solutions for the collection and control of data as part of its OpreX Data Acquisition lineup. To meet market needs and comply with industry-specific requirements and standards, the company continues to add new I/O modules with enhanced functionality to this line-up.

For the development and production of EVs, FCVs, PHVs, and on-board vehicle batteries, performance evaluation tests involving the measurement of voltage levels in multiple battery cells must be performed. The batteries used in such vehicles can have hundreds of interconnected cells, and the voltage levels at all these points must be measured simultaneously. The test devices that are used must be capable of withstanding voltages of several hundred volts (high common mode voltage) that are typically applied between the measuring terminal and the ground. The high-voltage analog input module developed by Yokogawa allows the measurement of multiple channels under high-voltage conditions, and is thus well-suited for the development and production of rechargeable batteries, as well as vehicles that use those batteries.

For more information contact Christie Cronje, Yokogawa South Africa, +27 11 831 6300, christie.cronje@za.yokogawa.com, www.yokogawa.com/za
Fast and easy TOC measurement

For power generation makeup water treatment – from reverse osmosis to demineralisers – the Mettler Toledo Thornton 5000TOC i sensor provides fast, reliable monitoring of total organic carbon (TOC) contamination in the water system. Organic contamination can be detected before it enters the steam cycle where its breakdown to organic acids can accelerate corrosion and potential damage.

Multi-parameter advantage: the Thornton 5000TOC i TOC sensor with intelligent sensor management (ISM) delivers the power of an analyser with the convenience of a sensor. The 5000TOC i sensor, coupled with the M800 multi-parameter transmitter, provides a user-friendly and economical analytical package. It enhances operational performance with a reliable, sophisticated and intuitive TOC measurement system by combining a proven TOC analysis platform with an advanced user interface with extensive system diagnostics.

Mix-and-match sensor capability: the M800 transmitter is available in two or four-channel versions. The two-channel version can accept one or two TOC sensors, or TOC plus one other parameter. The four-channel version can accept up to three parameters in addition to TOC, including conductivity, pH, ORP, dissolved ozone or dissolved oxygen, plus two pulsed flow sensors, saving cost and complexity.

Benefits of the 5000TOC i sensor include:
• Improved quality and reliability of calibration with a semi-automated process that ensures consistent results.
• Enables proactive maintenance through convenient diagnostics and sensor status data on an intuitive iMonitor user interface.
• Simplifies maintenance processes with in-depth diagnostic data, provided by detailed sensor status screens.
• Automated flow control improves the reliability of continuous, real-time TOC analysis by eliminating sensitivity to system pressure changes.
• Multi-parameter capability integrates TOC measurement with a comprehensive UPW monitoring system with up to four sensors.

For more information contact Darren Prinsloo, Microsep, +27 11 553 2300, darren.prinsloo@microsep.co.za, www.microsep.co.za

Software for low voltage distribution planning

Hager’s new software package is aimed at the design and encryption of distribution boards up to 4000 A. “It provides a real alternative to classical design software,” comments ElectroMechanica technical sales specialist, Divan Lerm. “A complete and innovative tool, hagercad is a real project manager that ensures you never miss a thing. Even as early as project creation, you’ll see just how effective it is. And once you’ve reached mid-planning phase, you’ll find the numerous practical, logically-linked functions absolutely indispensable.

“With hagercad, you do not need to have the catalogue with you. A simple click of a button, and you can see more information on any product, including dimensions and item-specific technical data.”

A major feature is the automatic circuit diagram function. This means that hagercad can generate single or multi-line plans with zero fuss, for various applications such as lighting, air-conditioning, KNX, or any customer-specific solutions. “What functions do you want to implement, and where? All you need to do is implement your specific requirements.”

Whether you are planning or working on enclosure calculations, hagercad is fast, accurate, and logical. As soon as you commence with the layout plan, the system proposes only enclosures into which devices will fit.

Selection is simplified further thanks to automatic queries: How do you want to arrange in-feeds and output terminals? What space reserves and protection types do you want?

“Every step of the way, hagercad makes sure that everything is exactly as you want it,” stresses Lerm.

Distribution planning is now a cinch thanks to hagercad’s automatic power loss and heat calculation feature. This takes into account every planned device, as well as the cooling surfaces of the enclosure itself. In this way, end users have total confidence that their calculations are sound, even in environments with critical room temperatures.

Even future users of the system can be included in the planning. That is why the program now also includes a user-friendly function for creating device labels and document revisions. It features a comprehensive documentation structure containing images, assembly instructions, and so forth. At the click of a button, all relevant operating instructions and photographs can be linked to your project. Data can also be exported in various forms, from Excel to AutoCAD.

Lerm summarises the main advantages of hagercad as follows: it manages projects, it generates single-wire and multi-wire control schemes, it integrates a 3D visualisation, and it generates a complete file, including records accessible from the software.

“All the information is available from one platform. If changes need to be made on a project, there are various ways to edit and change products quickly, which saves time on the design phase,” he concludes.

ElectroMechanica provides a hagercad training course whereby customers are issued with a free version of the software to use on their own computers, with no licence required, and no limit on the number of users. Certified users also receive a monthly follow-up to check if all is running smoothly, and to address any technical queries.

For more information contact Karen Zotter, ElectroMechanica, +27 11 249 5000, karenz@em.co.za, www.em.co.za
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Clearly visible flow measurement

To check the flow processes in pipeline systems and for insight into the interior of process pipes, many flow indicators are used in which the flowing medium sets a rotor turning and thus, to a large extent, visibly signals a flow. The special feature of Kobold’s special version, Type DAA, is that the rotor is housed in a glass cylinder.

This version ensures a functional flow check from two points of view. On one hand, its construction as a visible cylinder gives a relatively large and thus easily observed field of observation. In addition, the rotary movement of the Teflon rotor permits reliable monitoring of cloudy or dark media due to its noticeably bright colour. This type of device is already widely used and has proved itself in industrial use thanks to its functional reliability.

The design and construction of the DAA flow indicator deserves special mention. Due to integration of two wiper elements, Kobold has, for the first time, been successful in combining a flow indicator with a device which allows the equipment to be cleaned during operation. The sight tube can be rotated so that the wiper elements concentrate the dirt into two narrow strips on the interior of the glass. From there it is taken away effortlessly by the flow.

For this purpose, the Borosilicate glass tube is fitted with O-rings which slide easily, so that the cleaning of the unit can be carried out by hand even under full operating pressure. The flow indicator with integral cleaning device can be used in any position for checking the flow of gases and liquids. A choice of sizes is offered with connection dimensions G½ to G1½, with which flow rates of 0,4 l/min up to 100 l/min can be reliably checked.

Along with the standard housing version in brass, the units are also offered in a resistant stainless-steel version for aggressive media. If the rotor is unwanted for particular applications, e.g. for increases in flow rate, the unit is also available with just a sight glass with cleaning device. The type DAA flow indicators are usable for operating pressures up to PN 16 at temperatures up to 100°C.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
IRt/c setup with auto-tune temperature controllers

In many applications, heating elements are employed to heat a product in an oven, furnace, or with jets of hot air. Conventional control devices using contact thermocouples, measure and control the oven air temperature, heating element temperature, or air jet temperature, in an effort to maintain product temperature and therefore quality, often with less than satisfactory results.

Replacing the contact thermocouple (for example, measuring oven temperature) with a non-contact IRt/c (IR thermocouple) measuring product temperature directly will ensure that product temperature is maintained.

Some readjustment of the controller parameters is required because of differences in sensor response times (an IRt/c is much faster) and time required to heat the product, compared to the original sensor (slower). After installing the IRt/c and calibrating the controller reading using a Microscanner D-series, initiate the self-tuning cycle of the controller and check to see that the control is stable and accurate. If it will not self-tune properly, manually adjust the control coefficients to achieve stable control. Since the product is likely to change temperature more slowly than the original sensor, start by slowly increasing the ‘D’ of the PID coefficients.

For more information contact Temperature Controls, +27 11 791 6000, sales@tempcon.co.za, www.tempcon.co.za

Analysing pressure peaks

Keller’s Leo 5 high-resolution digital manometer features precise sensor technology, fast signal processing, peak recording and data storage with a time stamp. Designed for deployment in hostile environments, the instrument features a robust stainless steel housing, safety glass front, a 16 mm backlit display and capacitive touch controls.

Recording and analysing pressure peaks

Undetected pressure ‘spikes’ are a common cause of premature wear and untimely failures in pneumatic and hydraulic systems. In freshwater systems, this phenomenon is sometimes called ‘water hammer’. The Leo 5, with its pressure peak analysis mode, will sample and record system pressure at a rate of 5 kHz and with 16 bit resolution, enabling the troubleshooter to positively characterise system behaviour. With storage capacity for over 50 000 peak values, including temperature and time stamp, data from the data is exportable for detailed analysis via the included USB interface.

In the standard measurement mode, the unit operates at a sampling rate of 2 kHz and with an A-to-D resolution of 20 bits. The line-up includes seven standard full-scale pressure ranges between 3 and 1000 bar. In the temperature range of 0-50°C, the TEB (total error band) for pressure is ±0,5% FS.

Other features

The Leo 5 is available with a wide range of optional features, including a standard radio interface for measurements in inaccessible or mobile locations. Traditional analog outputs of 4-20 mA and 0-10 V DC and up to two switch outputs for process control and monitoring can also be provided. Configuration and data transmission take place via USB or RS-485 interface. Special housing materials, pressure connections and other user-specific options are available.

With high resolution for accurate measurement, pressure peak analysis and measurement data recording, the instrument has been adopted as an indispensable tool by pneumatic and hydraulic system mechanics.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za

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The goal of emission monitoring is to reduce air pollution caused by toxic emissions. Why emission monitoring?

An averaging period is used so that the minimum emission standards are met, especially for emissions into the atmosphere. For many plants, continuous emission monitoring (CEM) systems are a key component of their compliance responsibilities.

Yokogawa: a trusted partner towards 2020 plant emission compliance

The Air Quality Act, 39 of 2004 (AQA) controls air pollution in South Africa. This legislation requires that any operation producing air pollution – which in terms of the Act is referred to as an atmospheric emission – must ensure that they have an effective air quality management plan in place.

Companies must adhere to the national emission standards, which require the monitoring and management of these ambient air pollutants. Certain plants and businesses producing emissions must follow through with Atmospheric Emission License (AEL) applications if they want to operate legally, and within environmental and health responsibilities.

As it stands, the Department of Environmental Affairs has issued a list of activities detailing atmospheric emissions that could have a detrimental effect on the environment, including health, social, economic and ecological conditions. The deadline for the compliance of emissions in South Africa is April 2020. These listed activities and associated minimum emission standards are identified in terms of the National Environmental Management: Air Quality Act (2004).

The standards apply under normal operating conditions to permanently operating facilities, as well as experimental (pilot) plants. An averaging period is used so that the minimum emission standards are expressed in a daily average under normal conditions. Specific emission measurements are applicable using standardised sampling and analysis methods, which are provided for in the Act.

Why emission monitoring?

The goal of emission monitoring is to reduce air pollution caused by toxic gases like SO₂, NOx etc. emitted from the burning of fossil fuels. Under the USEPA CFR40 part 60, each plant must continuously measure and record its emissions of SO₂, NOx, and CO₂ (+O₂). In most cases, a continuous emission monitoring (CEM) system is required.

The standard system consists of a sample probe, filter, sample line, gas conditioning system, calibration gas system, and a series of gas analysers which reflect the parameters being monitored.

Typical monitored emissions include: sulphur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen chloride, airborne particulate matter, mercury, volatile organic compounds and oxygen.

All CEM systems must be in continuous operation and need to be able to sample, analyse and record data. They are usually housed in a field-mountable enclosure, where the sample gas is extracted, conditioned and analysed. The data is then processed via the required calibration validation calculations or procedures. The unit also serves as a data acquisition system, storing relevant emissions calibrations and alarms.

Applications of CEM systems include: petrochemical (process heaters and FCC units); power plants (stack monitoring); steel plants (furnaces); Industrial boilers (CEMS may be required depending upon the size of the plant); municipalities and utilities (accurate and reliable CEMS are a necessity); pulp and paper (a variety of emissions sources including power and recovery boilers); cement kilns; and mining.

Customised environmental measurement solutions to comply with CFR40 part 60

Services available cover the entire spectrum of analytical system design, equipment selection, and system manufacture. With extensive experience in the analytical products from other manufacturers, each system can be tailored with the optimum selection of equipment to provide the most cost-effective solution. Available products and services include:

- Field audits of installation sites.
- Selection of analyser types to perform the measurements.
- Complete sample system and automated calibration design.
- Data acquisition systems to gather and report the data needed for both federal and state agencies.

Comprehensive field service capabilities

Professional installation, start-up and commissioning, as well as training on the proper operation and maintenance of the analysers, is available to ensure the long-term reliable performance of the analytical system.

Yokogawa has the experience and resources to work with customers during all phases of the field installation and commissioning and the Analytical Service Team has the expertise to provide service and maintenance on nearly any type of analyser on the market. Other available support services include:

- Coordination of the Relative Accuracy Test certification.
- Priority technical support service (on call).
- Remote monitoring and diagnostics services.
- Annual service maintenance contracts.

Yokogawa has successfully commissioned CEM systems in many process industries like power, refining, petrochemicals, cement, sugar, paper and mining. The capable customer service support team assists with installation, commissioning and maintenance of these analysis systems. A plant operating at optimum levels goes a long way towards ensuring that sites are compliant with regulations, and as such, CEM systems are able to provide the mandated data as well as minimise long-term operational costs.

For more information contact Christie Cronje, Yokogawa South Africa,
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SpotScan gives pyrometers scanning ability

Fluke Process Instruments recently introduced the SpotScan line scanning accessory for the Endurance, Marathon, and Modline ranges of IR non-contact temperature measurement sensors. The accessory features a scanning mechanism that enables users to gather temperature data over a larger area on the target.

SpotScan helps optimise the performance of IR thermometers in applications ranging from metals processing and induction heating, to carbon graphite production. It is especially well-suited for web and conveyor hot spot or cold spot monitoring. With the accessory, industrial facilities can continue to utilise the advanced optics of their Fluke IR temperature sensors to achieve small spot sizes on the measurement target, but also ‘spot sweep’ over the target to monitor a larger area, thus obtaining additional information on critical production processes. Users can see a hot spot over a larger area and continuously monitor the analog output for temperature variations that exceed defined limits.

This allows plant operators to employ signal conditioning sensor capabilities to obtain temperature information in a variety of different ways. For example, use of the ‘peak picker’ function helps identify hot spots over a larger area. The averaging/response time functions provide average temperature over an extended range. In either case, operators benefit from an expanded view and increased awareness of process conditions.

Units are also available with options for sighting the IR instrument and periodically checking sighting accuracy. On-board controls make it easy to manipulate the end or centre positions of the scan, as well as its frequency. For sensors equipped with a laser, the user can simply turn the unit on to see exactly where the sensor is aimed. For units equipped with through-the-lens sighting, scanning at the end points can be stopped to make necessary aiming adjustments.

The SpotScan line scanning accessory utilises the existing sensor DC power supply. Its durable IP65 enclosure is designed to withstand ambient temperatures up to 60°C and an air purge option is available for use in dusty environments.

For more information contact R&C Instrumentation, +27 11 608 1551, info@randci.co.za, www.randci.co.za

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In the food industry, product recall is costly not only in terms of lost revenue, wasted materials and production time, but also in terms of brand reputation and brand loyalty. The sooner food safety issues can be addressed and mitigated, the lower the risk of a large-scale recall. This article outlines three of the most common food hazards that can result in recall and describes several sensor technologies that can help ensure food safety in each scenario.

Three common food safety hazards

Three concerns about food safety are undisclosed allergens, pathogens and physical hazards. Choosing the right sensor technology for the application can go a long way towards reducing risk in each of these areas, saving time and money in the long term.

Undisclosed allergens

Food allergies can be potentially lethal to the consumer, so it is essential that food packaging accurately discloses the allergens present in the food item. By law, eight major foods must be disclosed on packaging: milk, eggs, fish, shellfish, tree nuts, peanuts, wheat and soy.

However, one error that can occur during the processing of packaged foods is when a product is placed in the incorrect packaging, resulting in inaccurate labelling of the contents. For example, if a cheese-stuffed hot dog is accidentally packaged in a regular hot dog packaging, the package would not include the required milk allergen warning.

Solution: vision sensor for label verification

A label verification technology is critical to ensure that the proper labels are affixed to the right products. One very effective technology is a vision sensor, which can be used to verify the presence of the correct label on the packaged food item.

For example, bottle filling lines run many different types of products and require frequent changeovers. To prevent mislabelled bottles and ensure quality and food safety, a vision sensor can determine whether a label pattern matches a reference pattern taught to the device. Automating label inspections with a reliable vision solution improves quality control by reducing the risk of error common to manual inspections, which in turn helps reduce the incidence of product recall due to undisclosed allergens.

Pathogens (biological hazards)

Pathogens are another significant food safety concern. Also referred to as biological hazards, pathogens are any type of bacteria, virus or parasite (such as listeria or salmonella) that can cause illness to humans if consumed. Pathogens can be introduced to food products in several different ways before, during, or after food processing.

While there are many points at which biological hazards can be introduced, temperature change is one of the most critical conditions for pathogen growth. For example, when lunch meat products are not lowered to the proper temperature quickly enough, or are not maintained at the correct temperature after processing, harmful bacteria will be allowed to grow. Ensuring that temperature levels remain appropriately controlled at all points – from food processing to distribution – can help prevent many biological hazards from reaching harmful levels.

In addition, pathogens can be introduced if machine components come in frequent contact with food. Components without a hygienic design (e.g. deep grooves where food can become lodged) may not be easily cleaned even with rigorous wash-down practices and can become a food safety risk.

Solution: hygienic sensors with remote temperature monitoring capabilities

Monitoring and documenting temperatures throughout the food chain is imperative. However, manual documentation can be costly, requiring significant investments in time and resources.

An IoT solution to this problem is wireless temperature sensors. Wirelessly connected temperature sensors can be used to automate the documentation process by transmitting data through a controller. Not only does a wireless solution allow for historical data to be stored and accessed in the future, but wireless sensors also allow for real-time condition monitoring.

This means that, if the temperature of a food storage area rises above a set threshold, instant alerts can be sent, warning a manager that temperature requires adjustment. These alerts can be made viewable in the HMI, sent via text message, or set to initiate a warning signal on a tower light or other visual indicator. The ability to identify potentially dangerous temperature changes as they occur can help prevent product spoilage, saving costs.

In addition to remote temperature monitoring, another way to protect against the growth of pathogens during food production is to select sensors with hygienic design. Any sensors that regularly come in direct contact with food must be FDA rated. However, this rating is not required of the many sensors that do not typically come in direct contact with food. Still, in some cases, it is possible for food to splash, come into contact with the sensor, and then return back into the process.
these cases, a hygienic sensor – with minimal crevices so food cannot become lodged and difficult to clean – is a must.

**Physical hazards**

Physical hazards refer to potentially harmful, non-food particles that end up packaged with the food, often due to breakage of mechanical parts on the machine. While metal detectors can identify small pieces of metal before the product is distributed, other materials such as plastic and glass could slip by unnoticed, risking the health of the consumer.

**Solution: rugged sensors with all plastic housing**

Sensors are not the only machine components from which pieces can break off and fall into food, but they are still important to consider. In environments with frequent wash-down, it is important to ensure that the product is rugged enough to withstand high temperatures and pressure, and a high chemical resistance may also be necessary to withstand caustic cleaning solutions. In these applications, look for an IP69K-rated sensor that has been thoroughly tested to withstand harsh environments.

In addition, the material construction of the sensor makes a difference. While stainless steel might seem like the intuitive choice for food applications, a metal photoelectric sensor will always still have plastic components (e.g. window, light pipes, etc.) that can become dislodged and fall into the process. Because sensors with metal housing still contain some plastic, this means they have plastic-to-metal joints that are attached either by adhesive or mechanical means. When subjected to temperature change – such as during cleaning – the different materials expand and contract at different rates, creating small air gaps which leave room for water ingress.

On the other hand, a photoelectric sensor made entirely of plastic has joints that are ultrasonically welded together, becoming a single piece. This reduces the risk of the sensor window becoming dislodged and the sensor is also better protected against the ingress of water.

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**Yokogawa’s fibre optic heat detector**

Yokogawa has announced the DTSX1 fibre optic heat detector, an OpreXTM Field Instruments heat sensing and fire detection solution. Housed in an enclosure and suitable for use with specified fibre optic cables, the detector is a cost-effective all-in-one facility monitoring and fire detection solution. It is expected that this solution will aid in the timely identification of maintenance issues and thereby improve plant uptime and reduce maintenance costs.

Due to ageing facilities, labour related safety management issues, and various other problems, the risk of fire is always a concern at industrial facilities and there is thus a rising need for heat detection solutions. With their ability to measure the temperature distribution and pinpoint anomalies along the entire length of a cable, fibre optic heat detectors are a promising solution to such concerns, and devices of this type are increasingly used for monitoring temperature at a broad range of facilities.

In 2011 and 2014, respectively, Yokogawa released the DTSX200 and DTSX3000 fibre optic temperature sensors for use in applications such as the detection of abnormal heat build-up in coal and wood chip conveyors, the measurement of temperature changes in unconventional oil and gas wells, and the detection of the leakage of high and low-temperature liquids and gases from pipelines and tanks. In response to the growing demand for facility maintenance solutions that can prevent incidents caused by heat-related failures at industrial facilities, as well as the need to comply with fire detection standards, Yokogawa has developed the DTSX1. This easy-to-deploy detector is specifically designed for use in heat sensing and fire detection.

**Product features**

Cost-effective solution

All components including an easy-to-read display, relay output circuits, alarm circuits, and other hardware required for heat detection are housed in a single enclosure. Suitable for use with Yokogawa-specified fibre optic cables and designed specifically for use in facility monitoring and fire detection applications.

Measure data from four cables up to 16 km in length

The system can accommodate up to four channels receiving temperature data via fibre optic cables that can each be up to 16 km in length. In terms of number of channels and total measurement distance: the number of channels can be set to 1, 2, or 4 and the measurement distance can be set to 2, 4, 6, 8, 10 or 16 km.

**Ready-to-use GA10 templates for monitoring facility status**

Templates have been created for Yokogawa’s GA10 PC-based data logging software that facilitate the display of DTSX1 data. Monitoring windows for each type of application enable the quick detection and location of failures.

For more information contact Christie Cronje, Yokogawa South Africa, +27 11 831 6300, christie.cronje@za.yokogawa.com, www.yokogawa.com/za

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www.instrumentation.co.za  November 2018 43
Wise choices to decrease fire risk and improve safety

Fire safety at the workplace is a topic that is easily neglected and many businesses do not devote enough attention to it. The topic quickly becomes top of mind when people lose their lives, or when a building or substantial part of an industrial plant is destroyed by fire.

Employees, customers, suppliers and contractors are often not even aware of the fire risks that exist on a specific site, or if they do, they may not be trained for the eventuality. In many instances, businesses want to address their fire risks, but they do not know where to get appropriate guidance on the issue. Fire safety is a wide and specialised field and even if someone at that workplace is tasked to look into the risk, they might not know how to approach the subject, resulting in inadequate policies and measures.

South Africa has strict fire safety legislation in place, but this legislation is often only considered when a new building or plant is being built, or when the insurance companies get involved. Unfortunately, understanding and managing fire risk at the workplace on a continuous basis is the focus of only a very small group of people, even though the lack of understanding of the subject potentially impacts everyone. How can this situation be improved and a culture of fire safety be instilled in the workplace? Dr Niel Jordaan, engineering manager at Sperosens, sheds light on practices that can be helpful to decision makers in this regard.

Best practice from the mining industry

One approach would be to investigate the ‘best practice’ implemented by organisations where fire risk is managed and monitored on a daily basis, like the mining industry.

Mines understand and acknowledge that substantial parts of their operations are inherently risky and pose danger to employees and assets. Mines take fire safety very seriously. It is an integral part of the Mine Health and Safety Act, which governs their operations. The Department of Mineral Resources also plays an active roll in promoting safety at mines, and published a document in 2016 (DMR 16/3/2/4-B3), called the ‘Guideline for the Compilation of a Mandatory Code of Practice for Prevention of Fires at Mines’.

Quoting directly from this document:

“3.1 The main objective of this guideline is to enable the employer at every mine where a fire could pose a significant risk to the health and safety of persons, to prepare a COP which, if properly maintained and complied with, would improve control measures aimed at preventing fire incidents.”

“3.2 The guideline provides guidance of a general nature on the required format and content of the COP and details sufficient technical background to enable the drafting committee at the mine to prepare a comprehensive and practical COP for the mine.”

The application of the above is compulsory at mines and provides a good general guideline that can be adapted for fire risk management in other industries – even though the Mine Health and Safety Act may not be applicable in those industries – because the general approach is still valid and goes a long way towards addressing fire risks at the workplace.

One of the most useful tools from the document is a flowchart that can be used to implement and manage a fire risk process. It is depicted in Figure 1.

This process can be used by fire safety practitioners to address the following:

- Identify the fire hazards at the workplace.
- Evaluate the risk associated with the fire hazard by identifying the likelihood and consequences of the hazard occurring.
- Identify if a hazard is managed appropriately or not.
- If not, identify the steps that can be taken to reduce or eliminate the fire hazard.

Once the hazards are identified, it is much easier to find ways of improving the situation. Often only simple measures are required to improve the situation substantially, for example:

- Keep emergency exits clear.
- Improve housekeeping to reduce flammable materials.
- Improve emergency training of employees.
- Integrate the fire risk assessment with other safety considerations like; water supply for...
Rockwell Automation has introduced the Allen-Bradley ControlTower 856T 70 mm Tower Light system to market. This new system incorporates brighter LED illumination and a broad offering of visual and sound technologies, all in a 70 mm diameter housing. The ControlTower 856T is capable of accommodating up to seven modules in the same stack, offering users the ability to monitor more machine and process conditions in a single device. This new modular design allows the system to meet the widest range of signalling applications with a reduced number of components.

“Our new tower light helps engineers achieve faster time to market due to the reduced number of components they need to select,” said Adrian van Wyk, business manager power and components, Rockwell Automation Sub-Saharan Africa. “Users may also see a lower total cost of ownership due to the scalable visual and audible options, and the ability to monitor more machine conditions with a single tower light.”

The tower light features push-in terminal blocks in the base and internal DIP switches inside the light and sound modules that enable engineers to configure operation modes. Engineers can choose from a range of sounds that help alert operators to a machine’s status or condition. These sound options include multi-tone piezoelectric and multi-tone transducer technologies.

The ControlTower 856T system also includes non-stackable, beacon-shaped light modules for applications that require a low profile signalling device, but want to use the same mounting infrastructure of the tower light.

The IP66/67-rated system can be used in tough environmental conditions and in an extended operating temperature up to 70°C. To meet global requirements, the system is available in 24 VAC/DC and 120/240 VAC. The product line is available as separate components or as a pre-configured, factory-assembled stack light for optimal flexibility.

For more information contact Adrian van Wyk, Rockwell Automation Sub-Saharan Africa, +27 11 654 9700, avanwyk@ra.rockwell.com, www.rockwellautomation.co.za
PC-based control for the process industry

By Steven Meyer, editor, SA Instrumentation and Control.

Beckhoff Automation adds Ex protection to extend its reach in hazardous areas.

At Electra Mining 2018, Beckhoff took the opportunity to introduce the local market to its newly-expanded process competence. With its PC-based control architecture and the high-speed EtherCAT fieldbus, the company has always had the potential to implement process control solutions – in addition to its traditional machine automation capabilities – but what it lacked, was the ability to extend these into Ex zones. This has now changed. Benjamin Bruns, business manager process industry at Beckhoff, was out from Germany for the exhibition. SA Instrumentation and Control took the opportunity to chat to him along with Kenneth McPherson, managing director of Beckhoff’s sub-Saharan Africa office, about this interesting new development.

From Zone 0 to the cloud

“The addition of Ex functionality is part of a strategy designed to open up new markets for our PC-based control architecture,” explains Bruns. “Up until now most of our business has been in machine building, factory and motion control applications, but with the addition of the new explosion-proof components, our platform is now equally well suited to the hazardous conditions found in process industries, mining for example, or oil and gas.”

At the I/O level, the EtherCAT terminals of the ELX series provide a compact solution for applications requiring intrinsically safe signal transmission to or from a field instrument or actuator. “We cover all common industry standards by connecting via process protocols such as HART, NAMUR and FDT/DTM, which have been integrated into the TwinCAT programming environment,” says Bruns. “It’s a powerful approach because from the terminal up, everything is communicated using the standard EtherCAT fieldbus. So all we need to do is add the HART data, for instance, to an EtherCAT message, and thus we enable all the benefits of a fast Ethernet communication platform.”

In the ELX terminals, Beckhoff has achieved the explosion protection using galvanic isolation to ensure the same high accuracy and resolution of its standard ranges. The ATEX approved terminals are supported by a range of explosion-protected control panels and panel PCs of the CPX series, and from there, cloud communication is easily achieved using either the TwinCAT IoT software or an IoT coupler.

Open and fast and now Ex certified

Beckhoff’s PC-based approach combines the classical control functions such as PLCs, measurement technology and communications into one powerful system. With the addition of the hazardous area components and the process technology updates to the TwinCAT software, the platform is now undoubtedly suitable for almost any process control type application. But why would anyone want to switch from an existing setup?

“Whether we like it or not, Industry 4.0 is steering process control towards more open system approaches,” elaborates McPherson, who has been listening intently up to this point. “Not only that, but as the volumes of data increase, faster communication platforms will become more and more important. We tick the first box with our PC-based approach, which allows us to integrate the best of the IT and process control worlds into a single architecture. As for the second, our system incorporates a fast Ethernet fieldbus as standard, and is supported by the largest fieldbus organisation of them all – the EtherCAT Technology Group.”

“The addition of the explosion protection has positioned us perfectly for a move into process during the Industry 4.0 era,” agrees Bruns. “But we have found the best way to prove the benefit of our system to end-users who may not be familiar with our technology is through pilot projects. We identify a problem at a site and then set up a Beckhoff solution independent from the main control platform, linked through a gateway if needed. Invariably clients are impressed by the ease of setup and overall performance of our system, to the extent that the relationship develops from there.”

McPherson nods and says that is exactly the right approach to take locally as most projects, at least initially, are likely to be of the brownfield type. Given the pressures the South African mining industry currently faces, it seems inevitable that the more forward thinking managers will soon consider the feasibility of digitalisation to improve operating margins. At that point, Kenneth McPherson and his team could find themselves ideally positioned for expansion, thanks to the impressive new hazardous area capability of the Beckhoff control platform. Supported by a fast, secure communication network and cloud-based analytics functionality, PC-based control just became an option for the process industry in South Africa.

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Don’t forget to test your fire protection systems before the holiday shutdown

As the year draws to a close, it is natural that people start looking forward to the holidays. It is therefore quite easy to neglect to consider the damaging effect a fire could have on businesses during the annual shutdown. In light of the recent and tragic deaths of firefighters in Johannesburg, AST’s advice is to ensure that while attention turns to the festive season, business owners should ensure that their premises have the necessary fire protection measures in place.

Routine checks before the annual shutdown
Routine service checks must be completed prior to the holidays, which should include servicing of fire extinguishers, fire detection systems, sprinkler systems, automatic fire extinguishing systems, fire sealing and room integrity testing, and so forth.

Those businesses that currently do not have any form of fire protection may want to consider the losses they could potentially incur. AST can assist with most fire risk requirements through its knowledgeable and friendly sales team who are always ready to assist.

In addition to the above, it is also advisable to check all electrical systems and make sure they are properly isolated if necessary. Any process that can lead to an ignition must be disabled if not being used during the festive season, and all materials and equipment must be stored away.

In case anything goes wrong, make sure your insurance policies are in order and that your building is fully compliant with the requirements of the National Building Regulations and the relevant fire engineering standards. Should you have Pyroshield Gaseous Fire Extinguishing cylinders, be sure that they are up-to-date on all OHSA:PER (2009) requirements, such as mandatory 10-year hydrostatic pressure testing. By not doing so, you could fall foul of the law, and indeed may void insurance policies.

AST has a full team of fire system inspectors and fire systems designers who are able to perform inspections and ensure compliance. For hydrostatic pressure testing, they can assist with rapid transport and quick fill solutions at no cost.

If the company will be running a skeleton staff during the holidays, ensure that they have been trained to respond to a fire alarm and understand and are capable of following the necessary procedures. They must know where the nearest fire brigade is and how to reach them. These small details can prevent a business going up in smoke.

If the business is being shut down completely, make sure there is an automatic means of sensing a fire and remote signalling an alarm to someone. If not, AST can assist with this.

An early alert, followed with a firefighting response, can mean the difference between a minor incident and the loss of property, or even worse, lives. Performing these routine checks before you shut down for the holidays will help to ensure that you are not greeted by an unpleasant surprise when you return. https://www.facebook.com/astafrica/?ref=settings

For more information contact Grant Wilkinson, Alien Systems & Technologies, +27 11 949 1157, sales@astafrica.com, www.astafrica.com
Module for transformer hot spot monitoring

The Luxtron m924 utility module is a single printed circuit board offering four channels, which can be included in a transformer monitoring system. It offers RS-232 with ASCII and RS-485 with Modbus digital output for integration with standard PC or scada systems. In addition, it is guaranteed to be backward compatible with the Luxtron DipTip and Quality probes and all Luxtron accessories.

Unlike conventional winding temperature indicators (WTIs) that infer the hot spot temperature, this module measures the winding hot spot accurately and in real time without modelling. With instant results, controllers and pumps can act immediately to prevent transformer damage.

Leveraging LumaSense’s patented Fluoroptic technology and designed to replace the LumaSense m600 series utility modules, the m924 provides better performance with improved manufacturing and modern architecture. When combined with the Luxtron probes, the system provides precise and repeatable in situ temperature measurements and control of processes involving RF, EMI, magnetic fields and high voltages, while the small form makes it easy to integrate into existing equipment.

With over 40 years of fibre-optic temperature monitoring experience, LumaSense Technologies is a trusted provider of innovative temperature and gas sensing devices. By applying proven systems and software, customers in global energy, industrial materials and advanced technologies markets are able to reduce waste and inefficiency in their processes.

For more information contact Mecosa, +27 11 257 6100, measure@mecosa.co.za, www.mecosa.co.za
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Fortress creates safer workplaces for Industry 4.0

A leader in networked access control systems, Fortress’ technology helps create safer workplaces where employees in industrial environments are safeguarded from injury, equipment is protected from damage and overall productivity is enhanced. The company’s products ensure that actions and events are undertaken in a predetermined sequence, ensuring a safe working environment. Deebars has exclusively represented Fortress Interlocks for over 35 years in Africa and offer interlocking support for an extremely wide range of industrial applications, including power generation and distribution, iron and steel, automotive manufacturing, food and beverage, recycling, building and construction, robotics and palletisers. The extensive product range, available together with experience, means that Fortress can provide solutions for all safeguarding applications.

As the world races towards billions of devices connected to the Internet by 2020, Industrie 4.0 presents a huge challenge to manufacturers. Collaborative robots and the automation of tasks previously carried out by people, is reducing the need for traditional machine guarding while increasing the need for smart interlocks. Fortress prides itself on maintaining mechanical strength and reliability in its products, which have a reputation as being among the strongest on the market. More recently it has built-in additional functionality to help customers better manage their processes. As the importance of data increases, it is becoming a requirement for products to provide feedback through extensive, potentially global, data networks.

Network-enabled gate switches for harsh environments
The company has completed various installations utilising its network-enabled gate switches, designed to operate on safety networks. These products are easy to configure and install and provide additional operational feedback, as well as carrying out their safety functions. Manufacturing plants are notorious for their dusty, arduous environments and high vibration levels from machinery. This can play havoc with traditional safety interlocks, often causing tripping faults.

To overcome these problems, Fortress Interlocks has developed its Profi-enabled amGardpro interlock gate switch with built-in machine control technology, built to withstand the most strenuous conditions. With a locking force of 10 000 N, the Profi-enabled switch eliminates virtually all nuisance tripping faults, making amGardpro one of the most robust networked safety interlocks on the market. Profinet is an advanced industrial Ethernet system for transporting data in real-time between control devices (such as PLCs) and field devices (such as safety gate switches).

Using Profi-enabled amGardpro gate switches, a customer of Fortress, specialising in the manufacture of roof tiles, was able to reduce the wiring for each interlock unit, significantly reducing design, engineering, commissioning and maintenance costs, and virtually eliminating tripping faults.

The amGardpro is designed to protect personnel from inadvertent machine restart. Every gate switch at the tile manufacturer is fitted with a safety key which must be taken by any worker who enters the guarded machinery. The machinery cannot be restarted until the safety key has been returned to its original position outside the hazardous area. If access for multiple personnel is required, the interlock is fitted with a lock-out clip, enabling operators to attach a padlock to the gate switch for lock-out tag-out purposes.

Connecting Fortress safety gate switches to a Profinet network, provided an unprecedented level of diagnostic coverage for the tile manufacturer. Engineers could use standard Internet browsers to access diagnostic displays which provided accurate topology views of the network for rapid fault location.

This form of fault detection drastically decreased the level of production downtime, while allowing authorised personnel to access network displays remotely, meant engineers could diagnose system faults without being on site. The amGardpro Profinet switches have helped the roof tile manufacturer to make significant improvements in the way the plant is controlled, monitored and managed.

As industry evolves, Fortress’ view remains unchanged – protect people and productivity in this digital age.

For more information contact Deebar,
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Network-based process visualisation

VisuNet remote monitors with integrated thin client technology.

IT technologies such as PC and server virtualisation are establishing themselves in larger plants in the process industry to reduce the growing number of PC hardware components, while at the same time increasing flexibility and availability.

This trend has altered the landscape for operating and display devices for the process industry. Mechanical robustness, chemical resistance, and long distances from the actual host computer have always been standard requirements. Other requirements include suitability for certain production environments such as clean rooms or ATEX hazardous areas. Touchscreen operation, ever-increasing display resolution to match the growing complexity of the process information displayed, and new data connection technologies have been added to the mix. Instead of point-to-point connections of a PC and monitor to analog KVM extenders with limited cable lengths, we now have network-capable monitors with digital transmission over almost any distance and the freedom to connect to any PC or server on the network. Where each operator workstation previously needed a dedicated PC with an operating system and software, all that is needed now to connect to the host computers is the network interface(s) for the monitors. The Ethernet networking capability of operator workstations with integrated thin client technology is now a necessary prerequisite for connecting to a session on a server or virtualised systems.

**VisuNet technology**

Pepperl+Fuchs recognised this trend early on and for 10 years has offered operator workstations comprising a monitor, keyboard and mouse with standard Ethernet network technology. The VisuNet range of devices represents visualisation in networks. From as early as the 1990s, complete solutions consisting of a monitor with housing and mounting variants in stainless steel have been available to the process industry. These have been joined by up-to-date screen resolutions such as the most recent 16:10 and 16:9 'full HD' wide formats, and network technology with thin client-based monitors. Product lines have also been specially created for various industries, as each sector has its own specific requirements.

The VisuNet XT product line is specially designed for the outdoor oil and gas industries, with an extended temperature range for ambient temperatures from -40 up to 65°C, superb mechanical robustness, and sunlight readable displays. The range includes explosion-protected versions for ATEX Zone 2 and NEC/CSA Class I Div 2.

The VisuNet EX1 and VisuNet IND product lines are available for the traditional chemical industry. These have a rugged stainless steel housing and high resistance to chemicals and detergents. The extended temperature range from -20 to 50°C, and all the standard national approvals and many international approvals for hazardous areas make them versatile operating devices within process engineering plants.

The VisuNet GMP and VisuNet GXP product lines have a specific design and mechanical finish for the life science industries such as pharmaceuticals, cosmetics, and food. These can also be used in pharmaceutical clean rooms, non-classified production environments, and ATEX Zone 1/21 and Zone 2/22 hazardous areas. These device lines also meet the global GMP (good manufacturing practice) requirements of these 'regulated industries' in terms of easy cleaning and disinfection, low surface roughness of the stainless steel housing, and a seamless, slim design without surfaces where deposits can collect.

All VisuNet product lines vary in their mechanical design for different industries, although the underlying technology, display technology and interfaces for locally connected peripherals are almost identical. The monitor, housing, and mounting options can be configured from a modular system to meet individual requirements. The optional membrane keyboards with an antibacterial polyester film or stainless steel membrane surface can be connected to all VisuNet products. For cursor control, a user-friendly trackball or a joystick can be chosen as an alternative to the easy-to-clean touch pad. All monitors are available either as a touchscreen or with an antiglare glass surface. In addition to a model with an integrated Windows 7 panel PC for stand-alone operator workstations and the rarely requested operator workstations with an integrated KVM extender, network-based remote monitors with an integrated thin client are now predominantly used.

**Industrial process visualisation**

These remote monitors with a network connection – with the option of using fibre optic cables or WLAN – today form the backbone of modern industrial process visualisation and process and production control directly in the process plant. One of the terminal services protocols for network communication is used to display and operate the PC-based or server-based application software, usually scada or MES software. The RDP protocol, which is integrated into all versions of Microsoft Windows, is currently the most commonly used. However, other connection protocols such as VNC or ICA (Citrix Receiver) are also possible. This allows video data and operating inputs to be transferred digitally between the host computer and the remote monitor via an Ethernet network with switches and routers, with no borders, to and from all the host computers on this network.

There is also the option of using a secure Chrome-based ‘restricted web browser’ without window frames or function menus. This is suitable for web server-based applications on the host computer, as offered by some scada...
Medium-voltage switchgear that doesn’t require SF₆

At this year’s Hannover Messe, Siemens presented another medium-voltage switchgear that doesn’t require SF₆ as the insulating gas, the 8DAB 12. The system uses clean air consisting only of the natural constituents of ambient air as the insulating gas. The switchgear is a new addition to the 8DA and 8DB product family and also works with the proven vacuum switching technology. A vacuum-interruption unit handles switching and arc extinguishing, while the natural gas insulates the current-carrying conductors inside the housing of the metal-encapsulated gas-insulated switchgear (GIS). This type-tested system is used to switch high currents at the primary distribution level. The single-pole encapsulated 8DAB 12 is a SF₆-free medium-voltage switchgear in the Siemens blue GIS portfolio. Switches and switchgear that use SF₆ as the insulating, switching, and extinguishing gas remain an important part of the Siemens portfolio.

“With the addition of the 8DAB 12, we’re systematically expanding our portfolio of medium-voltage switchgear,” says Stephan May, CEO of the Siemens Medium Voltage and Systems business unit. “We’ll continue to offer our customers proven vacuum switching technology and single-pole switchgear encapsulation. They can now select the characteristics of the insulating gases used, depending on their requirements. The functionality and dimensions remain the same as the switchgear in our 8DA series.” The new blue GIS portfolio is Siemens’ answer to the market requirements of customers who want to use both the proven properties of GIS systems in their power grids as well as a non-chemical insulating medium. The blue GIS portfolio represents Siemens’ work with insulating media that contain no fluorine gases and meet all the strictest safety and environmental standards.

In recent years, the company has intensively researched alternative insulating materials and technologies that approximate the properties of SF₆-based gas mixtures and simultaneously ensure safe and economical switchgear operation. The gas contained in the 8DAB 12 medium-voltage switchgear consists exclusively of natural constituents of the ambient air with no chemical additives. These constituents are, for example, nitrogen (N₂) and oxygen (O₂). The 8DAB 12 is a gas-insulated medium-voltage switchgear that works with the proven vacuum switching technology, so the operator benefits from all the advantages of this technology: no maintenance, compact design, high operating and personal safety, and high availability. Clean air provides the added benefits of easier handling during installation and recycling. In addition, it is not necessary to report the quantity of gas used.

Siemens has been using its vacuum interruption technology in its medium-voltage switchgear for more than 40 years. It is also used in high-voltage systems and recently in switchgear up to 145 kV as well. With vacuum switching technology, when the contacts open the switching arc burns in a metal vapour plasma between the contacts inside the vacuum extinction chamber. The metal vapour condenses back onto the contacts after the arc is extinguished. No decomposition products occur, and the arc doesn’t affect the surrounding insulation. This means that natural gases that aren’t suitable for extinguishing arcs can be used to insulate the current-carrying conductors.

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and MES software manufacturers based on HTML5. It will not be obvious to the operating personnel that they are working with a browser.

The RM Shell, an intuitive setup menu for configuring the remote monitor and designed for touchscreen operation, allows the commissioning engineer to specify all default settings and approved host computers and sessions with password protection. None of this will be noticeable to the user afterwards: After the monitor is switched on, it automatically connects to the host computer invisibly in the background, and the users see their application directly on the host computer, just like a normal monitor.

Important additional functions of the RM Shell can be configured, such as switching between different host computers using key combinations or displaying several applications (e.g., DCS and MES) at once on a twin monitor (extended desktop). It can also be set up to mirror an application on other monitors for large plants with multiple alternative operator workstations. Configuration menus are available for integrating the data from any optional connected barcode or RFID readers, as frequently used in the pharmaceutical and cosmetics industries, or for optional built-in WLAN antennas. All this can be supplied in a design compliant with the ATEX directive.

Built-in mechanisms for detecting a break in the connection to the host computer and for a configurable, automatic reconnection to an alternative host computer on the network in the event of a failure of a host computer, without requiring any further action or rewiring, are key to operating reliability and availability.

IT security is ensured with the latest versions of the connection protocols, a built-in firewall, and the option of disabling the USB interfaces for external storage media. The internal flash memory of the integrated thin client is read-only.

If the standard modular system does not fully meet the requirements, as is sometimes the case with the extensive boundary conditions in the life science industry, for example, customer-specific adjustments are available. These are mostly mechanical changes, in particular for mounting devices in the production plant. Europe, America, and Asia Pacific each offer a dedicated Solution Engineering Center for HMI for this purpose.

For more information contact Pepperl+Fuchs, +27 87 985 0797, info@za.pepperl-fuchs.com, www.pepperl-fuchs.co.za
Swedish group, SKF, has been implementing digital transformation since 2015, investing close to €19 million to carry out its digital revolution at the Göteborg plant which has, for over a century, been producing the quality bearings on which the group’s success is based.

A culture of automation
Over the years the plant has witnessed developments brought about by successive waves of automation, including the introduction of the first forklifts in 1970, the implementation of lean manufacturing ten years later, and the arrival of the first industrial robots in production in 1995.

2015 saw the Göteborg facility launch the complete modernisation of its spherical roller bearing manufacturing plant. The initiative, based on a model called World Class Manufacturing, saw SKF gradually opening more sites in a bid to bring production closer to customers. The objective was to increase customer uptime and productivity by helping to reduce their stock levels and improve lead times.

However, more sites led to a significant fall in production for European plants. The global bearing and rotating technology specialist reviewed its production and adapted it to a product catalogue that is as varied as ever, but with smaller volumes to achieve the digitalisation goal, which is not to produce more but to gain in flexibility.

One new Industry 4.0 production line
Historically, the Göteborg plant ran four conventional production lines, each dedicated to the manufacture of only one type of bearing. Digitalisation resulted in the replacement of the four original lines with a new, almost completely automated Industry 4.0 production line that can deal with different sizes and selections. Three of the previous lines have already been shut down, while the life of the fourth has been extended to serve as backup and will be shut down by December, when the workshop’s digital transformation will be complete.

The digital transformation incorporates a range of solutions from robots and AGVs to sensors and tablets. There are 22 industrial robots on the new production line, which is divided into four distinct units corresponding to four production steps namely grinding, assembly, marking and lubrication. In all, 25 different software applications are used to coordinate the process. A MES collects the production data in real time in order to control activities, such as the management of the AGVs. This system is in turn coupled with new ERP software, linking production to demand to ensure the seamless running of the workshop operation, which involves some 1500 trips by the AGVs daily.

In the grinding phase, the rings are placed on pallets before being grasped by a massive six-axis robotic arm. Fitted with adaptive grippers on the wrist joint, the arm can grasp nearly 200 different types of rings. (It takes just three seconds to automatically adapt to parts with diameters of between 180 and 400 mm.) Plunged into a closed chamber, the rings come out less than a minute later, ground and polished, for placement in a pallet whose volume is monitored by three cameras. Once the pallet is full, an AGV takes it to the assembly island, after which follow the final two phases – lubrication and marking. The QuickCollect sensor, developed by SKF, ensures constant monitoring of machine operation. For convenience, operators who move between the workstations are able to take instructions directly from their tablets.

With a wide range of solutions always available to solve a particular problem, SKF did not hurry to adopt all cutting-edge technologies. Instead, the company first thoroughly assessed each technology to ensure it met a real need before the process was integrated. For example, in order to be integrated into the new grinding unit, certain machines dating back to the 1980s were retrofitted with the addition of servomotors and an IoT layer. Automation was done without interrupting production.

Digital transformation is an ongoing process at SKF, as the company continues to strive for added value through improved efficiencies, product quality and service delivery.

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More and more industrial users are discovering the potential of three dimensional software-aided object measurement. With the VisionApp 360 software, Wenglor now offers a smart tool that makes 3D object detection possible with up to 16 sensors, and greatly simplifies the combination of individual point clouds for the user.

Comprehensive 360° images and recordings can be implemented without any programming knowledge. Due to the convenient user-friendly interface, the sensors can be synchronised and calibrated via simple parameter configuration. Visual field ranges can be artificially extended and greatly increases the number of possible uses for the 2D/3D profile sensors.

Applications are diverse: objects to be measured can be circular, oval or angular and their surface characteristics play practically no role. For example, the software is used to measure the precise measurement of tree trunks at sawmills, or in the automotive industry for measuring gaps between auto body parts.

The sensors can be set up in any desired arrangement such as next to each other in a circle or a line. A calibration layout with corners can be arranged freely for the application. Measured values are read out via a TCP interface as a combined point cloud, which can be processed with additional software tools in order to obtain the desired results.

VisionApp 360 can be used together with all Wenglor products of the weCat3D range, including profile sensors with smaller visual fields as well as high-end profile sensors with larger visual field ranges. At the same time, individual point clouds from up to 16 sensors can be merged into a combined point cloud.

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Advanced data management from Siemens

Siemens is innovating its data management software for process analytical technology (PAT) with Simatic Sipat version 5.1, which allows users to monitor and control the quality of their products in real-time during manufacturing. The latest version features a web-based user-friendly datamining application to transform massive amounts of data into tabular and graphical data information. Moreover, the new charting capabilities deliver an instant view on data correlation, shortening end user investigation time. Simatic Sipat 5.1 helps companies in the pharmaceutical, food and beverage and fine chemicals industries to shorten time to market and improve product quality.

With the web-enabled Simatic Sipat Dataminer application, data from multiple Sipat data sources and versions can easily be collected, while the intuitive search capabilities and the instant preview of the query results in a comprehensive data retrieval process. Moreover, by applying the data alignment capabilities on this data the end user will have large data volumes correctly aligned within a matter of a seconds, as well as an in-depth data analysis created in tabular or graphical format. The Dataminer delivers a global view on local data.

Additionally, the graphical object of the Dataminer delivers capabilities to zoom into parts of the graph, to compare data points over multiple and different graph types in order to give more insight to the end user. With each dataset plotted on the chart, the metadata (e.g. collector settings, diagnostic info, active alarms) can be consulted. These new charting capabilities (e.g. Spectral Heat Map) deliver an instant view on data correlation, shortening investigation time.

About Sipat
Simatic Sipat is a scalable and modular software solution that enables companies to extend their quality assurance activities on a step-by-step basis within the scope of the PAT initiative. With PAT, product development and production processes can be monitored, controlled and optimised by measuring the critical-to-quality attributes of raw materials, process materials and procedures. This continuous monitoring of product quality can prevent deviations from specifications and therefore reduce production costs. In addition, it allows for real-time release testing, so quality inspections on final products can be reduced or completely eliminated.

For more information contact Jennifer Naidoo, Siemens Digital Factory and Process Industries and Drives, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za

Motion analyser software shortens design time

Rockwell Automation has released an updated version of the Allen-Bradley Motion Analyser software tool, which offers an optimised user experience with intuitive navigation and in-workflow product selection. This can help engineers more efficiently develop complete motion control systems for their machines.

Using the Motion Analyser software, engineers can determine a system’s specifications, evaluate multiple products to find the best fit, finalise the design and create a bill of materials. The tool can also help reduce motion-system design time from a multiday process to a few hours.

“We sized a motion system can be time consuming,” said Christo Buys, business manager, control systems, Rockwell Automation Sub-Saharan Africa. “In the latest release of the software, we have simplified workflows to improve the user experience. We have also added additional features that make the process of designing a motion system as efficient as possible.”

Key improvements include faster axis definition and sizing, redesigned solution search and configure components features, additional application template profile support, and the ability to import from a legacy motion profile with the support of more advanced motion segments.

For more information contact Christo Buys, Rockwell Automation Sub-Saharan Africa, +27 11 654 9700, cbuys@ra.rockwell.com, www.rockwellautomation.com/en_za/overview.page
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Remote monitoring of electric motors

Leveraging digital technology is said to be key to participating in the next wave of economic growth. At the very least, using it will allow mines, process plants and other industrial operations to reduce operating costs.

Fanie Steyn, manager rotating machines at Zest WEG Group, says one of the areas that stand to be most impacted is predictive maintenance: “This is where access to accurate data can be used to increase production efficiency and reduce downtime, and for the first time, industry will be able to do this remotely with electric motor installations.”

WEG Motor Scan is a new solution available from the Zest WEG Group that facilitates remote monitoring of electric motor installations. This innovative technology allows engineers and maintenance personnel to make informed decisions about the health of installed motors and react accordingly, depending on the data captured.

Steyn says that the solution uses Industry 4.0’s digital technology including the IoT and big data analytics. The technology allows for the monitoring of running hours, measurement of vibration and surface temperature as well as providing data on speed and start/stop time. The load and efficiency will be included in the second phase. Data is extracted via Bluetooth using a smart device with the innovative app that is available on android and iOS phones and tablets. Users can also access the data on laptops and desktops via a dedicated web portal.

Powerful analytics for data processing

Powerful analytics help to process the data and predict pending failures or hidden problems based on frequency spectrum analysis. Warning levels are pre-set based on acceptable baselines of temperature/vibration and sophisticated software is able to plot performance curves with the captured data. The data is sent to the cloud for storage facilitating fast access and more accurate decision making.

“Using the WEG Motor Scan solution minimises the requirement to manually collect and monitor data, and it eliminates the guesswork from preventative maintenance routines,” explains Steyn. “This removes the inefficiency of reactive maintenance and assists in minimising motor failure.”

Solutions are currently available for frame sizes from 63 to 450, providing monitoring for motors ranging from 0,18 kW up to 1250 kW and can be fitted on newly manufactured motors, or retrofitted to existing installations. The sensor itself is battery powered and has an estimated life span of three years. It is designed to work in ambient temperatures ranging from -40 to 80°C, has a protection rating of IP66 and can operate in Zone 1 areas with a T4 temperature rating. Offering optimum flexibility, the sensor can be used on direct online starting as well as variable speed drive (VSD) applications.

“This is a major value add for our customers and will in reality set a new benchmark in predictive maintenance,” concludes Steyn.

For more information contact Zest WEG Group Africa, +27 11 723 6000, info@zestweg.com, www.zestweg.com
As part of Siemens Industrial Edge, the company is launching applications for Sinumerik Edge, the machine-level platform specially designed for the machine tool industry, at AMB 2018 in Stuttgart. This is the first opportunity to see the Edge application Optimise MyMachining/Trochoidal for use in trochoidal milling applications.

Optimise MyMachining/Trochoidal provides users with updates for the existing NC program, optimised machining processes, and sustainability for retrofit applications using dynamic machine data and corresponding data inputs. This leads to reduced tool wear, improved machine lifetimes, and thus to lower overall inventory costs, which in turn increases machine availability, leading to significant productivity gains.

High-performance Sinumerik Edge technology makes all this possible. Computation is based on individual, optimal machine and axes-based dynamic data. A control-based interface allows the machine to be programmed directly using Sinumerik Edge-based computational power. This prevents any adverse effects on the machine’s machining performance which optimises the process. Optimise MyMachining/Trochoidal is particularly suitable for use with older machines as it reduces the mechanical wear in the machine considerably.

With Siemens Industrial Edge, Siemens offers users the chance to close the gap between local and cloud-based data processing to suit individual requirements. Edge computing allows large volumes of data to be processed locally almost in real-time and without any feedback. There is also an additional reduction in memory and transfer costs as large volumes of data are pre-processed and only the relevant data is finally transferred to a cloud or factory-level IT infrastructure. Siemens Industrial Edge supports cloud transfer protocols for MindSphere, its own open, cloud-based IoT operating system. In the future, it will also support Message Queuing Telemetry Transport (MQTT), making data transfer safe and effective. With Sinumerik Edge, Siemens offers a local platform for software applications developed specially for machine tools, which captures, pre-processes and analyses high-frequency data during machine tool operation, and which is integrated into the relevant automation solution.

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BMG’s range of Nord aluminium drives is available with the nsd tupH (sealed surface conversion system) anti-corrosion treatment, which has been developed for improved process reliability in extreme environmental conditions and hygienically critical applications.

“Nord’s corrosion protection system, which is resistant to acids and alkalis, is a highly efficient treatment for gear units, smooth motors, frequency inverters and motor starters used in wash-down applications,” explains Derrick Louw, Nord product specialist, BMG. “The drive units are a robust alternative to painted geared motors or stainless steel versions. The surface treatment process permanently bonds a high hardness layer to the substrate to offer the same corrosion resistance as stainless steel. Advantages include extended surface life, a substantially lower mass, improved installation options and cost efficiency.

“The easy-to-clean surface treatment is not a coating like a paint layer, which can detach or flake off. This durable layer offers optimum protection against scratching, blistering and the penetration of corrosion, even if the unit is damaged. As a surface conversion system, it is highly resistant to extreme environments and aggressive cleaning chemicals, even under high pressure wash-down conditions.”

Nord drives with nsd tupH comply with FDA Title 21 CFR 175.300 and, for this reason, are suitable for food applications. They have been successfully tested for blistering, corrosion, scratching and salt spray and resistance to common cleaning agents used in the food industry.

Typical applications for the drives with nsd tupH surface treatment include the food and beverage industry, bottling and canning plants, water treatment and sewage plants, as well as offshore and onshore applications. This range is suitable for use in any plant that requires a wash-down after production.

The range, assembled locally by BMG according to stringent international quality and safety specifications, has earned recognition for reliability, efficiency, reduced noise levels, extended service life and minimal maintenance requirements.

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Eaton motor control for easy installation

Magnet’s portfolio of space saving Eaton motor control and protection devices offer motor starting and protection solutions in diverse industries, including mining, oil and gas, pulp and paper, the automotive sector and general utilities.

“This range, which encompasses contactors, circuit breakers and overload relays, has been designed for easy installation and simple set-up, increased accuracy, greater visibility into the motor status and a higher degree of protection,” says Magnet Group managing director, Brian Howarth. “Eaton motor control and protection products efficiently meet the demands of challenging applications, including motor control centres, field starter panels and heavy duty pumps, as well as conveyors, fans, pumps and compressors.

“Magnet has planned Eaton roadshows around the country to offer clients an opportunity to interact with Eaton product specialists and to engage with products prescribed for their facilities’ specific applications. Eaton will display products from its motor control range, along with comprehensive solutions for automation, circuit protection and power distribution.”

DILM contactors for utilisation category AC-1/400V are rated for normal switching duty for 3-pole, non-motor loads. Operating characteristics include non-inductive and slightly inductive loads and electrical characteristics for switch on and switch off are 1 x rated operational current. Typical applications for this range are for electric heaters.

DILM contactors the AC-3/400V utilisation category are rated for normal switching duty for AC induction motors. Operating and electrical characteristics are switch on from stop at up to six times the rated motor current and switch off during run, at up to 1 x rated motor current. Typical applications include compressors, lifts, mixers, pumps, escalators, agitators, fan conveyor belts, centrifuges, hinged flaps, bucket-elevator air-conditioning systems and general drives for manufacturing and processing machines.

DILM contactors for utilisation category AC-4/400V are rated for the extreme switching duty of squirrel-cage motors. Operating characteristics are inching, plugging and reversing. Electrical characteristics for making and breaking the current are up to six times the rated motor current. Typical applications include printing presses, wire-drawing machines and centrifuges, as well as for special drives used for manufacturing and processing machines.

Magnet offers a technical and advisory support service throughout the country. For more information contact Samantha Sookrah, Magnet, +27 31 274 1998, samantha@magnetgroup.co.za, www.magnetgroup.co.za
Linear modules with one-point lubrication simplify assembly

The third generation of MKK and MKR linear modules from Tectra Automation expands the range of equipment options for the company’s linear module series. In the corrosion resistant versions, hard chrome plated ball screw drives and ball rails ensure a high resistance to chemicals.

The module consists of an anodised aluminium profile body with integrated ball rails and the option of ball screw or belt drive. Both drive types are provided for in the new generation, in sizes 65, 80 and 110. They are interchangeable with previous versions in the same dimensions and do not require large constructive adjustments. As ready to install assemblies, the new modules reduce construction and installation effort in all types of machines and systems.

One-point lubrication system
Bosch Rexroth addresses the industry-wide trend of automating maintenance work with one-point lubrication systems, thus increasing the life of the axes with a comprehensive lubrication concept. The corresponding components, ball screw drive and runner block, are ready for one-point lubrication with liquid grease or oil. Operators choosing to use their own lubricants can order the corresponding components with only corrosion prevention and complete the initial lubrication for start-up themselves. The standard version is delivered with initial lubrication making the product ready to use.

Tectra Automation supplies the ball screw drive variant of the linear module in lengths up to 5400 mm. A screw support prevents vibrations at high rotational speeds and thereby increases the application window for highly dynamic or challenging applications. Modules with belt drive are available in lengths up to 9 400 mm.

The absolute measurement system, IMS-A, can be integrated into the modules in sizes 80 and 110. From system start, it captures the exact position of the carriage directly and without a homing cycle. Using the incremental measuring principle, the IMS-A operates wear-free and is resistant to contamination and electric fields.

A new switch concept simplifies assembly and saves time. The magnetic field sensors fit directly into the profile frame without additional mounting accessories so that no interfering contours are created. This means that the space-saving design is retained in practice.

Two carriages with variable centreline-to-centreline distance also accommodate larger attachments with increased system rigidity and the use of centring holes in the carriages and frame produces a form-fitting connection, which substantially simplifies any adjustment work.

For more information contact Julie van den Berg, Tectra Automation, +27 11 971 9400, julievandenberg@tectra.co.za, www.hytecgroup.co.za

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Emerson
BMG’s fluid technology services include solutions for hydraulics and pneumatics, lubrication, fuel and industrial filtration systems, hydraulic hose and fittings, as well as instrumentation, pumps and industrial valves.

“The range encompasses FG EcoPart filter elements for stationary and mobile hydraulic systems,” says David Dyce, business unit manager, Fluid Technology, BMG. “These components, with defined filter performance and purity class, comply with stringent DIN and ISO standards and have all other necessary standard industry approvals. The series is available in different versions, with various grades of fineness.”

These components are suitable for diverse hydraulic applications, as well as gear oil treatment. The filter elements are designed to reduce solid particle contamination, prevent the ingress of dirt from the environment and maintain the properties of the hydraulic fluid for an extended time period.

Included are a range of FG desiccant breathers designed to protect machines from the damage caused by moisture and the ingress of particles. When contaminated air enters the top of the breather, it passes through layered filter media, blocking particles from entering and thus preventing wear to equipment surfaces. The filtered air passes through a bed of silica gel, which effectively removes moisture. Silica keeps the equipment dry by attracting moisture from inside the equipment reservoir during service or shut-down.

FG desiccant breathers have an enlarged housing, which ensures up to 20% more absorption of moisture than conventional breathers. The centre tube is constructed from a robust nylon material, providing rigidity to the element and allowing an even air flow through the silica gel. For additional system protection, secondary filter media prevent any possible migration of silica dust.

Breathers are suitable for use in hydraulic units where there is high humidity and temperature fluctuation. Typical applications include wind energy, power plants, tunnel construction, aerospace and manufacturing processes, as well as petrochemical and chemical plants.

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A continually increasing number of industrial applications are being switched from fieldbus technologies over to Ethernet networks. Planners and system designers are therefore facing the challenge of selecting the most suitable network components. In the infrastructure, patch panels help to connect the devices installed in the network simply, safely, and in a structured manner.

Patch panels are passive components that link two segments or levels to one another – a solid installation to a stranded one, for instance. In the field of automation, they act as an interface between the internal control cabinet cabling and the network devices installed outside the control cabinet. This enables the point at which the field cabling in the control cabinet will be connected onsite to be defined as early as the system configuration stage.

All the components to be included in the control cabinet are preinstalled when it is manufactured. So, when the corresponding system is started up at the end customer’s premises, just the field lines need to be routed. The patch panels are located toward the bottom of the control cabinet, next to the cable entry, so start-up personnel no longer have to open any cable ducts. The internal control cabinet wiring will have already been implemented using pre-assembled patch lines in advance. Thanks to the easy connection of the Ethernet cable to the patch panel, it is possible to do without the complex installation of an RJ45 connector with special tools.

During configuration, CAD systems require a unique equipment identification (EI) for every interface and component. The patch panels therefore feature a sufficiently large free space with a marking on their front, where an EI label can be affixed. This enables networks to be created in a structured manner during the configuration phase and is an easy way of ensuring that everything will run smoothly on site.

Reliable protection against external influences
The eight new patch panels offer a variety of different connection technologies, so all users can find the connection method most convenient for them. The easy, fast, and secure installation process is up to 60 percent faster than when using conventional patch panels, making installation economical. Depending on the version used, the cross-control-cabinet field cabling is simply applied to screw, Push-in, or IDC connection terminal blocks. The Push-in terminal block allows for a more convenient connection compared to the commonly used screw connection technology. The greatest time savings, however, are gained with the IDC fast connection technology. Using this insulation displacement technology, the single wires are no longer stripped; instead, they are just inserted in a slot. The terminal block is then pressed closed with a finger. A colour code printed on the underside of the opened cover enables the wires to be
Surge voltages can also destroy expensive and the malfunctions caused by them. Particularly sensitive to surge voltages interfaces operate with low signal levels.

Integrated surge protection. Ethernet the four PP-RJ versions come with various protection mechanisms.

High system availability, thanks to various protection mechanisms
As the first patch panels for DIN rails, the four PP-RJ versions come with integrated surge protection. Ethernet interfaces operate with low signal levels at high frequencies, which makes them particularly sensitive to surge voltages and the malfunctions caused by them. Surge voltages can also destroy expensive network components. Especially with regard to cabling across several buildings or control cabinets, the devices may be adversely affected by the coupling of voltages, so the new patch panels meet the DIN EN 61643-21 surge protection standard, with IEC test classification C2. The ‘field-side port’ is intended to be used as a surge protection interface. Depending on the version, it is designed either as an RJ45 or a connection terminal block beneath the cover, so the eight signal paths are protected.

Thanks to a patented system of shield current monitoring, the new patch panels are also exceptional in applications with Power over Ethernet (PoE). If the installation is characterised by different potential references, this may cause equalisation currents to flow through the cable shielding, which can damage expensive network devices or disrupt communication. To counteract this, the patch panels provide simple diagnostics in cable connections using PoE. Any equalisation currents or coupled currents are measured and indicated via an LED. This process takes its power transmitted by the PoE supply. The LED lights up if the cable shield current exceeds 30 mA. This shows the user that a general grounding issue exists in their entire installation. Individual control cabinets or parts of a building might have been connected improperly with regard to their potentials or there is still a high risk of electromagnetic influences on the cable during installation.

Summary
The new Ethernet patch panels from Phoenix Contact allow for quick and easy connections to be made between field cabling and control cabinet cabling.

New PoE injectors with patch panel connection technology
The connection technologies supported by Ethernet patch panels are also used in the new product family of PoE injectors. Phoenix Contact has added 12 devices to its existing range. The PoE injectors supply devices installed in the field – surveillance cameras, for example – with data and power via just one cable. For the first time, the function of a patch panel has now been integrated into these new components. With a large selection of different connection terminal blocks, they therefore offer a fast way to implement cable shielding contacting without tools, while also providing strain relief. Furthermore, the INJ 2000… PoE injectors feature surge protection and shield current monitoring functions.

The devices in the new product family are available for different performance classes if required. With a supply of up to 30 W, these devices meet the IEEE 802.3 at (15.4 W) and IEE 802.3 at (30 W) standards.

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Radio frequency identification (RFID) technology is increasingly found in food tracing as technology improves. Implementing RFID is not uncommon in the case of large containers containing raw products and in the mixing of bulk materials. It offers companies a number of ways to streamline and manage their capacities, focusing particularly on the issues of traceability and process reliability. Using wireless technology for identification purposes opens up a new dimension in automatic data recording. The automotive industry has been using RFID for years – where a tag is attached to the car body and is encoded with data options for each vehicle.

As RFID tags are read/write devices and no visual contact of the tag is required, they offer more functionality than bar code technology. Moreover, they are very robust so that they can even survive harsh ambient conditions such as high temperatures, mud or wetness. This technology supplied by SICK Automation has allowed Kagome, a Japanese tomato processor, to ensure product traceability which increased efficiency in the production processes at its Australian factory.

**Food and traceability**

Traceability has always been important for the food and beverage industry. In recent years in Australia, however, the need for real-time recalls has increased due to plant processing errors or recalls from Food Standards Australia New Zealand (FSANZ). An effective tracking and tracing programme consists of a number of components, starting with accurate and fast identification.

For many years the identification workhorse has been the ubiquitous bar code. As foodstuffs move through the production process, they are identified by a unique code; on containers when in process, on packaging for the finished product, on cartons and pallets during transport and on shelves in retail stores. Kagome, however, was looking for a real-time identification solution that could handle mud and tomato juice as well as heat, wind, and rain.

**The operation**

The Kagome factory operates 12 harvesters loading tomatoes into more than 300 14-ton capacity bins which, once full, are unloaded at a bin pad where a truck picks it up and transports it to a nearby weighbridge. One trip from the tomato fields to the factory takes approximately 90 minutes and each truck can load three bins – that is an average of 42 tons of tomatoes per truck. Three years ago trucks would queue at the weighbridge, waiting for up to 12 minutes before the truck load could be weighed.

This was partially because of Kagome’s quality control process where three samples from each bin had to be processed in the laboratory for quality control purposes and to validate the tomatoes origins. Additionally, paperwork to document the harvesting process and quantity and quality of the yield was required, for which the truck drivers were responsible. A paper-based quality control system of this kind increases the potential for human error, which can sometimes result in contaminated products reaching consumers. To ensure traceability, the company decided it needed a paperless automated identification solution to be implemented at the weighbridge.

**The solution**

Kagome installed six RFU63x units from SICK at the factory’s weighbridge and discharge hill. Each unit is equipped with three antennas for double stacked bins. Resistant and stable RFID tags were attached to the tomato bins, accompanying them from the start of the harvesting process. As a result, the RFU63x meets all Kagome’s requirements set out for paperless automated identification of tomatoes. In this way, RFID helps to prevent the typical errors made during inbound and outbound goods processes, such as incorrect quantity and quality data, or missing accounting entries, for example.

RFID allows real-time identification of where the tomatoes originate. Due to paperless identification, truck drivers no longer need to leave the truck at the weighbridge, contributing to enhanced driver safety. This efficiency gain means that the truck is spending less time at the weighbridge and that truck jams in front of the weighbridge and the tomato drop hill have largely been eliminated. Truck time at the weighbridge was reduced from 12 minutes to two minutes, enabling truck drivers to do one additional trip per 12-hour shift. This means a productivity gain of 504 tons in total, which has been achieved thanks to using the new RFID technology from SICK Automation.

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The TwinCAT IoT Communicator makes it easy for PLCs to communicate with mobile devices by connecting the TwinCAT controller directly and securely to a messaging service through TLS encryption. For smartphone and tablet users, the associated app ensures that process data can be represented on all mobile devices in a clear overview. Alarms are sent to the device as push messages.

The communicator exchanges data using a publish/subscribe mechanism. Since no special firewall settings are needed, integration into an existing IT network is easy. Information is exchanged via a message broker that uses the standardised MQTT protocol and acts as a central messaging service in a cloud or local network. A high level of communication security is guaranteed by proven TLS encryption (up to version 1.2).

Transmitted process data can be displayed on mobile devices using the IoT Communicator app, which is available for both Android and iOS operating systems.

The app also incorporates an integrated QR code scanner to facilitate entry of access data for communication between the broker and individual users.

The communicator simplifies the transmission of push messages. It offers a number of advantages over conventional email and SMS messages by visualising live data, variables and status values. This makes it an ideal addition to the related TwinCAT IoT and TwinCAT Analytics software products.

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Wireless tank level monitoring

Storage tanks can be found in a wide variety of locations and environments, from indoor or outdoor installations to above or below ground. Properly monitoring and managing levels inside these tanks can help improve efficiency and increase productivity and profitability. This article outlines the advantages of wireless tank level monitoring.

Choosing a tank level monitoring solution

There are a number of methods and tools that can be used to measure tank level. From visual inspections to floats to ultrasonic sensors, there are many technologies to choose from that vary in terms of accuracy, reliability and cost.

Visual inspections and measuring sticks may be relatively inexpensive, but they are labour-intensive and prone to error because they rely on manual reporting methods. More accurate tools, like floats and submersible pressure transducers, are not dependent on human labour to measure levels, which can simplify processes and minimise the risk of error. However, in some applications, a non-contact solution is preferable in order to avoid contaminating the contents of the tank. In addition, prolonged contact with tank contents, for example in the case of viscous or caustic liquids, can degrade the performance and accuracy of these measurement tools.

An ultrasonic sensor is a good choice for applications where a non-contact solution is needed. These sensors use sound waves to detect objects, so they do not need to come into contact with the materials they are measuring. They are immune to target colour, reflectivity, or transparency, and are unaffected by light conditions. Ultrasonic sensors capable of a proportional analog output enable greater measurement accuracy and are a preferred choice for these applications.

Three advantages of a wireless network

Wireless tank level monitoring can be a cost-effective solution and provide the real-time data and versatility to help businesses keep pace with change in the industry. Implementing a tank monitoring system that utilises ultrasonic sensors in a wireless network has many advantages. Wireless systems can be set up quickly, cost-effectively, and without large commitments of human labour or changes to infrastructure. They are capable of monitoring many containers and can adapt to meet changing needs and scale to accommodate new containers.

The following are three of the biggest advantages of wireless tank monitoring systems:

1. **Save time and money on installation**

Compared to wired technologies, connecting level measurement tools in a wireless network is far more cost-effective. The infrastructure changes required in a wireless system are minimal, and a wireless system is far easier to implement compared to a wired system.

In a basic setup, a wireless node is connected to a measuring device, like a wireless ultrasonic sensor, and installed on the container. Each node in the network is bound to a wireless gateway or controller with an integrated gateway. Next a site survey is conducted to verify the connection between the deployed nodes and the gateway.

The system is then configured, and inspection parameters and alarm thresholds are set. A system like this can monitor many containers and can be set up in a fraction of the time and at a much lower cost than a wired network.

2. **Improve efficiency with real-time monitoring and alerts**

With connected devices, asset managers can easily access tank level data in real-time, improving both efficiency and productivity. For example, with real-time monitoring of remote containers, managers can strategically plan visits based on actual need instead of sending staff to a site based on forecasted expectations of container levels. This saves time and costs while ensuring that tanks are full and processes are running smoothly.

In addition, automated alerts can be set up to notify staff of potential issues, minimising the opportunities for emergency situations to develop.

3. **Adapt to changing business needs**

Business needs can change over time and companies may need to add or move containers at a site to keep up with new demands. Wireless networks are versatile, scalable, and adapt easily to changing requirements. Containers can be moved as often as needed without altering the system or disconnecting the measuring device, which means containers can be monitored even while in transit. New nodes from new containers can be integrated into the existing network, or a new network can be deployed to accommodate a new group of tanks without the time and labour commitments of altering a wired network.

Conclusion

Implementing a tank monitoring system that utilises ultrasonic sensors in a wireless network has many advantages. Wireless systems can be set up quickly, cost effectively, and without large commitments of human labour or changes to infrastructure. They can monitor many containers and can adapt to meet changing needs and scale to include new containers. Automated alerts can be set up to notify staff of potential issues, minimising the opportunities for emergency situations to develop.

The data generated by these systems is more accurate and can be accessed from anywhere and at any time. This allows managers to make more informed decisions about their assets, how they are used, when they should be serviced, and what staff and resources are needed to service them.

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Complete Process Control Solutions and Services Provider
Quality inspection for packaging

Quality inspection is critical in all manufacturing and packaging lines, especially in the food and beverage sector. Being able to catch defective products before they are shipped to customers can bring significant savings in both time and money, preventing expensive product recalls, wasted production and potentially expensive legal costs.

For perishable products, quality inspection of the packaging is also critical. An unreadable barcode or an incorrect expiry date could result in perfectly good products being recalled and discarded. And increasingly strict legislation is making clear marking a top priority for all types of product. In 2008 the Consumer Protection Act was implemented to prevent exploitation or harm to consumers by regulating the way in which businesses interact with consumers, and market their products and services. Packaging and labelling must now adhere to certain standards. Food labelling Regulations (R146) was also introduced to standardise labelling and to ensure all food and beverage manufacturers adhere to the same standards.

As production lines become ever more automated, inspection and quality control also need to be more automated. Automation systems can improve a line’s effectiveness, by performing tasks quickly and accurately. However, the real benefits only truly materialise when ‘smart’ automation is implemented utilising such features as smart data.

When this is applied to vision inspection systems, defects can be spotted and dealt with swiftly and accurately. However, the real benefits only truly materialise when ‘smart’ automation is implemented utilising such features as smart data.

For inspection and quality control Omron’s very compact visual inspection units monitor production in real-time and respond instantly to any defect. Data sent from the vision system is processed locally and sent via the cloud for powerful analysis that allows the system to take appropriate actions. The system is totally interlinked, with the improved connection between machines in a manufacturing line delivering more accurate quality control and higher efficiency. If any error is detected, the system can often compensate automatically, allowing production to continue unaffected. Omron’s smart automation solutions are fast and possess plenty of processing power, yet they are easy to use. This combination of speed, intelligence and user-friendliness delivers the most effective inspection and transparent quality control.

Following the rules

For an inspection system to be able to make smart decisions it needs to collect data from a sensor, such as a vision camera. These can be set up to monitor different aspects of the product, perhaps to check for imperfections, or to check labels for misprints or missing information. Powerful processing then analyses this data to monitor the process, comparing actual with expected results. If any problems are found, the system follows programmed rules on how to respond to any changes. It may even be able to deal with the matter automatically, but in every case an operator will always be informed for correct process management and in case any additional action that might be required.

The more data there is, and the more processing performed, the ‘smarter’ the machine can be to help keep manufacturing lines running longer, with less downtime and higher productivity. All data is logged by the system and is typically stored in the cloud. This also helps meet regulations as operations can later be reviewed for auditing purposes.

Flexibility, now and in the future

In addition to catching production errors and reducing waste, a further advantage of an effective inspection and process management system is flexibility. By combining vision, motion, control, safety, and robotics, all in a single management system such as Omron’s Sysmac Studio, production lines can readily accommodate short production runs and adapt to market demands. Line set-ups can be changed quickly for new production runs, and the recognition pattern for quality inspection can be updated easily in the software. This ensures different variants or even different products are produced and packaged correctly.

The system is also future-proofed as it can be easily adapted to accommodate any changes to regulations. Therefore, manufacturers do not need to worry about what they might need to do to their production lines to meet future regulations. All that is required is to rollout a new firmware update for the existing solution.

For more information contact Omron Electronics, +27 11 579 2600, info.sa@eu.omron.com, www.industrial.omron.co.za
LTF Series Time of Flight Laser Distance Sensors are designed to accurately measure targets at distances up to 12 meters. They provide reliable detection regardless of colour or material, even at an angle, providing a reliable solution for challenging targets. They solve a broad range of industrial measurement applications, including part-in-place, part profiling and positioning, and roll diameter and web tension control.
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Control limitations on mineral processing plants.

Michael Brown is a specialist in control loop optimisation with many years of experience in process control instrumentation. His main activities are consulting, and teaching practical control loop analysis and optimisation. He gives training courses which can be held in clients’ plants, where students can have the added benefit of practising on live loops. His work takes him to plants all over South Africa and also to other countries. He can be contacted at Michael Brown Control Engineering cc, +27 82 440 7790, michael.brown@mweb.co.za, www.controlloop.co.za

I was recently asked to conduct a control loop audit on a mineral extraction processing plant which was fairly old and had been acquired by new owners. A new and very modern control system had been installed on the plant, but with the exception of some of the measuring transmitters, the other control components such as valves and variable speed pumps were the originals.

The plant had been running for some time after the new owners had taken over, and the recoveries were not as good as had been hoped. The plant process engineers were of the opinion that the problem was mainly due to poor tuning of the controllers, and this was the reason why they contracted me to conduct the audit.

Once I started work in the plant I soon established that whilst the tuning on the whole was not as good as it could be, the main problems were due to really bad and vastly oversized valves and pumps.

It is sometimes extremely difficult to explain to process engineers who have had no practical control training that tuning will not solve all problems. Many of them seem to believe that if there is a controller installed on a process, then it can control anything, and all that needs to be done is put in the correct tuning parameters. I have listed below some basic points on practical control which is directed more at controls on mineral processing plants.

General discussion on practical control and its limitations

1. Feedback control systems can do a remarkable job, but do have limitations insomuch as they can only operate at a maximum speed, which is limited by the dynamics of the process. As a general rule, fast processes like flows can be controlled quickly. Slow processes can only be controlled slowly. This particularly applies to many levels and things like temperature and pH. In addition, good feedback control is completely reliant on good loop components, like the measuring transmitter and particularly the final control element like control valves and VSPs (variable speed pumps). In addition, feedback control cannot have zero variance (i.e. eliminate all errors), as the control can only act after an error occurs. (Error is defined as the difference between the measured process variable and the setpoint.)

2. Control problems: it is often not realised by non-control personnel that tuning is mostly not the problem. The vast majority of control problems are caused by problems in the other loop components, which include the measuring transmitter, the valve and the actual process itself.

3. Ninety percent of all control problems are caused by the final control element. Its function is to ‘translate’ the demands of the controller into a physical input to the process. The final control element must ‘follow’ the controller’s output exactly. The better and faster the final control element operates, the better will be the control. The control element must also be also sized correctly. Oversized control elements multiply all their problems by the oversize factor. In particular valve sizing is not based on line size. Properly sized control valves are generally one or two sizes smaller than the line size. Good control valves are expensive, but allow much better control than cheaper alternatives. It should be noted that as a general rule of thumb, control valves should ideally operate above 20% of opening.

4. Variable speed centrifugal pumps have a problem insomuch that they cannot operate below a minimum speed, which is often around 30 – 40%. This can limit the range of control, and it makes pump sizing very important for control. For example, in one particular case I encountered recently I found a pump stopping at 60%. The operating speed at the current load was actually only a few percent higher.

5. Cascade control: it is excellent practice to employ this technique with important slow processes, such as levels and temperatures. Slow processes can only be controlled relatively slowly, and it is vital that the final control elements do exactly what the ‘master’ controller demands. Therefore if one feeds the output of this master controller to the setpoint of a ‘slave’ flow controller, which controls the final control element, then one can often get away with all sorts of valve or pump problems, as the flow control loop is extremely fast and will at least get the final element to deliver the correct flow relatively quickly. Even if the flow loop is in a complete cycle, which is occurring on at least one of the loops on the plant I was in, it will allow the master to keep its PV well at setpoint.

6. It must also be realised that process dynamics can change with time, as components wear or tanks get ‘build-up’, and may be quite different at different loads. Therefore tuning must be revisited from time to time.

The most common problems I encounter in metallurgical plants are as follows:

- Oversized valves and pumps.
- Unsuitable valves: however it must be noted that on slurry applications there are only a few valve types that can be used. The most commonly used valve these days is the Dart valve.
- For some reason the airflow valves in nearly every plant I have been in are really bad and very sticky. People are not normally aware of this as they generally don’t change the airflows very often.
- Cheap measuring equipment.
- Poor control strategies, like undersized sumps: these vessels very often perform an important function by ‘buffering’ surges caused by varying
inputs to the sumps, and thus allow a relatively constant flow of product to downstream processing units. The actual level in the sump is generally not important, provided it does not go too high or too low. Unfortunately personnel with little understanding of the control objectives often tune the level controllers on the sumps with fast parameters to try and keep the level constant – sometimes referred to as ‘tight level control’.

- Because of the limitations of speed at which feedback control can react, the control will operate much better if feeds to processes can be kept as constant as possible, and if they do vary, then the changes into downstream processes should be as slow as possible to allow controls to catch the changes. Therefore upstream buffering (surge tanks) helps stabilise processes like float banks.
- A control system does not eliminate variance; it merely transfers it from one side of the process to the other. For example if we have varying input to a float cell and we control the level, then keeping the level constant will transfer the variance to the input of the next cell. Unfortunately level controllers in most float cells can only be tuned relatively slowly, so they cannot deal effectively with rapidly fluctuating inputs, and the fluctuations will increase as you go down the bank. The only methods to overcome this are firstly to keep the input to the bank as constant as possible, typically by using a surge tank that will absorb input fluctuations, or secondly, by the use of more advanced control feedforward/feedback combination systems. There are several of these commercially available, but they do need to be tuned properly and the tuning checked at regular intervals as plant conditions change with time.

• Random fluctuations in measurement usually occurring at relatively high frequencies are referred to by control people as ‘noise’ (see Figure 1). This is often mistaken by plant personnel as bad control and instability. However, the noise frequencies are usually far too high to really have any effect on the process, and in fact in most cases do not actually interfere with the control.

Modern control systems can easily hide the noise on the process variable if you insert filtering (damping) on the signal coming in from the process. It makes the trends much smoother and they look much better. However, there are two major drawbacks to this: firstly what you see on the screen is not what is actually happening in the process, and sometimes with huge filters you do not see things like surges or other problems. Secondly, the filter forces you to slow the tuning down to deal with this extra lag in the dynamics, and your control response can be seriously affected.

Unfortunately, as it is easy with modern digital control systems to implement filters of any magnitude, they are often applied. Plant personnel then become accustomed to seeing smooth lines on trends, and everything looks much better. When I remove filters, the operators mistake the noise for instability and get very upset. However, they need to be trained on the problems with filters.

The one problem that can occur with noise is that it passes through the controller, and if the controller’s gain is relatively high it can possibly bump the valve around, which can shorten its life. Furthermore, the flow through the valve also starts jumping around, and passes this into the next process. Therefore, in the case of processes like flotation tanks where the one vessel feeds the next down the line, it may be necessary to use filters to try and avoid this happening.

My own philosophy in plants is to try and control without a filter, however horrible it looks on the screen, and if I do use them, then I keep the filter as small as possible.

Test for oversized valves
To conclude the article is a test performed on the plant that illustrates an extremely easy way to see if a valve is oversized. Figure 2 shows a closed loop test performed after tuning on a tank level control. The test was performed at normal load conditions and it can be seen that the controller output is working extremely low down, in fact below 5%, which means that the valve is almost at seat. This is not a region where one should even consider controlling, and it is amazing that such good control was being achieved.
PC-based control increases throughput in additive manufacturing

Automated post-print processing puts the finishing touches on 3D printed parts.

Additive manufacturing processes can produce parts with the most complex geometries in a single operation. However, post-processing these 3D printed parts is time consuming and costly. In order to remove this bottleneck in the production process, PostProcess Technologies has developed a series of machines that leverage a ground-breaking chemistry of detergents and abrasive media. The newest example is the Hybrid DECI Duo. The multi-functional machine provides automated removal of support material and surface finishing. It was automated with control technology from Beckhoff.

The challenges of post-print processing in additive manufacturing include surface finishing and the removal of support material. Particularly when building complex geometries and structures via 3D printer, any overhangs or other asymmetrical contours require the use of support materials. These ensure that the workpiece does not collapse during production and they maintain the correct shape of the part during printing. The support materials must be removed afterward, creating inefficiencies. In addition, the parts printed from materials such as advanced thermoplastics, light-cured resins and metals often require finishing to achieve the desired look and feel, while still meeting the requirements for correct size, texture and precision.

Finishing the job 3D printers started

PostProcess Technologies, a start-up designated company headquartered in Buffalo, New York, was founded in 2013 with the vision to revolutionise additive manufacturing by removing the post-print bottleneck and thus paving the way to economical series production. The aim was to translate the diligence and accuracy of manual finishing into a fast, automated process.

The core of the PostProcess solution is the proprietary Automat3D software, which, guided by the company’s Agitation Algorithms (AGA), facilitates different agitation or intensity levels in post-print processing. It was created by PostProcess founder and current president, Daniel J. Hutchinson, building on his extensive background in software development. By individually adapting the process parameters, the solution can meet the requirements of even the most varied part geometries without destroying important structures. Michael Frauens, principal process development engineer, explains how important this is: “Damage to parts while finishing is simply not an option. Often, these parts cost tens of thousands of dollars and may have taken weeks or even months to design and build. This highlights the importance of our Automat3D software. It ensures that all parts are accurately processed, regardless of geometry.”

Even internal structures inside the parts that are difficult to access can be processed in this way. Jeff Mize, CEO of PostProcess Technologies, says: “Our solutions combine hardware, software and chemistry in an unprecedented way, helping us provide an automated, intelligent and comprehensive offering to handle post-printing of materials and geometries for additive parts, further accelerating Industry 4.0."

The answer to 3D printing challenges: automation and IT convergence

As PostProcess began to implement its machines, partnering with Keller Technology, a global custom manufacturer, the company knew it needed proven, robust automation components. Since most of the 3D printers are not PLC driven, but rather PC driven, they decided to use PC-based control technology from Beckhoff. PostProcess has developed a range of different machines for removing support materials or surface finishing. The newest addition to their product offering is the Hybrid DECI Duo, the first multi-functioning machine that combines both processes in a single compact system that helps optimise valuable production floor space.

In combination with TwinCAT 3 software, the CP6706 Panel PC with a 7-inch
CONTROL SYSTEMS

A touchscreen and quad-core Intel Atom processor serves as the all-in-one control and HMI for the Hybrid DECI Duo system. “A PC-based platform that combines Windows OS and automation tools based in Visual Studio, was an ideal fit for our programming efforts, given that we are not specifically controls engineers, but lean more toward computer science,” says Hutchinson. “This convergence of automation technology and information technology enables greater flexibility with our workforce, drawing from many different pools of engineering talent.”

TwinCAT 3 PLC and NC/PTP serves as the back-end for the DECI Duo system, providing real-time automation of the part processing operations. PostProcess has also standardised on a motion system from Beckhoff, consisting of AM8000 series servomotors with one cable technology (OCT) and several AXS100 EtherCAT servo drives. Hutchinson continues: “The AM8000 series motors fit our needs perfectly. Compact size and minimised cabling were at the top of our list of requirements, and these motors hit all the right marks. Plus, the combination of the OCT motors, servo drives and EtherCAT made commissioning very simple.”

Hutchinson explains the benefits of EtherCAT as system bus for the Hybrid DECI Duo: “EtherCAT is our sole communication protocol for all of the PostProcess Production series machines. The microsecond-level communication speeds are unparalleled, while it also supports flexible topologies and the use of third-party hardware.”

EtherCAT I/O terminals are installed across all PostProcess lines. According to Hutchinson, this provides maximum flexibility and streamlines future expansion. Safety technology is also integrated in the EtherCAT I/O system. Special safety equipment such as e-stops and guard doors are easily connected via TwinSAFE I/O terminals.

**Reduced programming time and costs are part of the winning process**

Reduction in development time was the most important benefit realised by PostProcess upon implementation of PC-based control and EtherCAT. “With the Beckhoff system, our development time was cut in half,” reports engineering manager, Marc Farfaglia. “Much of this is due to the flexibility of the TwinCAT 3 with the ability to reuse function blocks and other code on subsequent machines.”

TwinCAT also provides further benefits for engineering, as it pairs very well with the Automat3D software. Hutchinson concludes: “The ability to utilise industry-standard development tools and configuration management services, such as Microsoft Visual Studio, Visual Studio Team Services and third-party extensions, greatly improves the development time, organisation and learning curve for our developers. During development, the software-only simulation mode allowed significantly lowered hardware and software integration time.”

As the 3D printing and additive manufacturing market continues to evolve at a rapid pace, it is exactly this level of flexibility that will help OEMs like PostProcess shape the future of the industry.

For more information contact Michelle Murphy, Beckhoff Automation, +27 11 795 2898, michellem@beckhoff.com, www.beckhoff.co.za
Ultrasonic sensors for switching and measuring

Longer operating ranges and broader areas of application are only two of the features offered by the Leuze HTU 418B and Leuze DMU 418B ultrasonic sensors. Suitable for switching and measuring applications, the devices have an operating range of up to 1300 mm.

These fully metal-enclosed ultrasonic sensors offer protection to Class IP67 and are available in either cylindrical M18 or M30 housings. The compact housing allows the sensors to be installed in locations where there are space constraints, and this offers end-users greater flexibility.

Both series were equipped with an improved teach function: two push buttons for defining two independent switching points simplify setup and increase flexibility when using the sensors. Device types with an IO-Link interface ensure the intelligent, simple and user-friendly connection and activation.

Temperature compensation prevents measurement errors that could be caused by various environmental conditions. Four operating modes, e.g. for changing from synchronous to multiplex operation, offer high flexibility during use.

The ultrasonic sensors operate using a switching behaviour that is largely independent of the surface of the sound-reflecting materials. They are available with various sound lobes, i.e. with different opening angles. The narrow sound lobes in particular permit the detection of the smallest of objects or the detection through the smallest of apertures at short response times.

Countapulse Controls, the official distributor for Leuze sensors in southern Africa, is able to offer technical support including assistance in selection of the most appropriate sensors for any given application.

Continuous baggage tracking

Delayed, damaged or lost baggage reduces customer satisfaction and generates additional costs. International Air Transport Association (IATA) Resolution 753 on baggage tracking is intended to encourage airlines to reduce mishandling by implementing cross-industry tracking for every baggage journey. The resolution states that IATA members shall maintain an accurate inventory of baggage by monitoring the acquisition and delivery of baggage. For this to be successfully done, IATA relies on experienced partners.

SICK Automation offers reliable technologies for baggage tracking through its laser, camera and RFID technology, along with single source support. The company supports the process with its extensive baggage-tracking expertise, while intelligent sensor solutions for reading bag tags enables the continuous tracking of a bag from the beginning of a journey to the final destination. From receipt of the bag by the airline up to the point at which it is claimed by the passenger, SICK offers a perfect baggage relay system that is transparent, efficient and fast. The benefit is obvious: performance enhancement for end-to-end baggage transportation.

The company is helping airlines and airport operators close the gaps in baggage handling. This cuts costs and increases customer satisfaction – the ultimate intention of IATA’s Resolution 753: the guidelines for the continuous tracking of bags from bag drop to reclamation.

This can be achieved with the help of expert advice and intelligent sensors. To do this, SICK pay particular attention to forward-thinking baggage identification concepts in order to offer the right answers and solutions. The different requirements presented by airports and airlines in terms of the use of different technologies also means that solutions need to be adapted to local airlines. This means taking what is best for the respective customer into consideration to achieve a tailored, sustainable, long-term solution. This thinking means that existing systems are retrofitted and upgraded when necessary, which enables systems to run smoothly for longer.

The range of products for track and trace is highly developed and can be integrated into existing systems. RFID, laser, and camera technology all correspond to state-of-the-art systems and are used individually or combined in hybrid solutions on the baggage journey. This begins with the simple hand-held scanners at the bag drop and extends to complex reading stations in the sorting process, which ensure a high throughput and accurate sorting, right up to the reading gate at arrivals – and ultimately, the final destination.

For more information contact Gerry Bryant, Countapulse Controls, +27 11 615 7556, bryant@countapulse.co.za, www.countapulse.co.za

For more information contact Mark Madeley, SICK Automation Southern Africa, +27 10 060 0568, mark.madeley@sickautomation.co.za, www.sickautomation.co.za
Prevent unplanned outages

Siemens offers comprehensive onsite assessment solutions to keep its customers’ switchgear systems up and running.

Air insulated (AIS) and gas insulated switchgear (GIS) are important elements in transmission networks. It is crucial to evaluate and understand their current condition in order to know when and where maintenance activities may be required before a fault causes a disruption in the grid. With its new and economical Onsite Condition Assessment Solutions, Siemens ensures the smooth operation of its customer’s assets.

There are many challenges for high-voltage switchgear: increasing load requirements, high demands from customers and processes, and limited backup power. But the number of these high-voltage components over 30 years old is increasing, making defects or failures more likely. In order to prevent major damage due to ageing devices, it’s crucial to properly monitor and service high-voltage switchgear regularly with as little downtime as possible.

Analyse the past, assess the present, and predict the future

Siemens offers a broad range of proactive services for all phases of AIS and GIS lifecycle management. Deviations from the specified conditions are identified by condition assessments, and maintenance and spare-part services bring the asset back to optimal condition. "Siemens’ Customer Services have a strong heritage of expertise across transmission and distribution equipment, with highly skilled technical experts globally available,” says Armand Tsague, field service engineer at Siemens. “With our Onsite Condition Assessment packages, we analyse the past, assess the present, and can predict the future of the asset’s condition. This significantly enhances the reliability and availability of the switchgear.”

Levels of condition assessment

The company’s condition assessment portfolio is split into three levels. The first and second levels are performed while the asset is running (no switch-off required). The most important is the partial-discharge measurement. For temporary monitoring, the experts prefer to use ultra-high-frequency (UHF) methods to detect partial discharges in the switchgear. They might combine this method with acoustic partial discharge detection, a visual inspection that employs the audit tool SAFE, a thermography scanning of the entire substation, and a gas analysis to measure moisture, SF6 percentage, dew point, sulphur dioxide content, and other values. The third level comprises additional electrical measurements that can only be performed when the asset is out of operation: for example, dynamic contact resistance measurement (DCRM) of the breaker, timing tests, outdoor bushing measurement, and transformer current measurement.

Benefits to operators

“Our on-site partial-discharge monitoring offers a number of advantages to operators even if they aren’t using Siemens equipment,” Tsague explains. These benefits include precise failure prediction, access to real-time condition data by installing UHF sensors, an early warning of malfunctions, and keeping the asset healthy and in service for as long as possible – which delays the need for major investments in new equipment and avoids the high cost of repairing serious damage.

What is a partial discharge (PD)?

PD is a partial dielectric breakdown in an electrical insulation system under high voltage. It causes continuous deterioration of the insulating material that could lead to a complete breakdown and outage. Therefore, it is important to detect PD at an early stage in order to prevent unplanned downtime. The main causes of PD in GIS devices include moving particles, voids in solid insulation, floating electrodes, defective insulators and protrusions or corona.

Sensors for ultra-high-frequency (UHF) measurement

Partial discharges in a GIS generate current and acoustic signals, and they also produce UHF electromagnetic waves, which can be detected using special sensors. If the GIS is not pre-equipped with embedded sensors, external ones can sometimes be installed. Studies have confirmed that UHF measurement is very sensitive to partial discharge signals and it is becoming the dominant method for both commissioning tests and temporary and permanent monitoring.

For more information contact Jennifer Naidoo, Siemens Digital Factory and Process Industries and Drives, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
Mass flow measurement of gases

The Kobold MAS mass flowmeter works according to the calorimetric method and was conceived for gas flow measurement. Since gases can be compressed, the volume changes with pressure and temperature. In practice this means that calibration should be done for a particular working pressure and temperature. This conversion is not needed with the MAS device because the mass flow of the gas is determined by measuring the heat transfer.

The gas is led through a laminar-flow bypass and due to the pressure difference that arises a small quantity of gas branches off into the measuring pipe. With laminar flow, the distribution ratios of both gas quantities remain constant, which is important for the calculation of the flow volume. There are two temperature measuring points (RTD elements) in the measuring tube arranged in sequence (one behind the other). The gas flowing through is subjected to a constant amount of heat. The gas molecules absorb that heat and carry it away. This creates a temperature difference between the sensors that increases with the amount of gas flowing. The temperature difference creates a resistance difference in the RTD elements. It is now only necessary to convert the temperature difference into the standard mass flow. A rotating LCD display shows the corresponding volume flow in standard units per minute. The digital display makes it virtually impossible to make a reading error.

Typical applications are in process control, laboratories, gas display tables, OEM applications, leakage rate testing, filter monitoring and gas flow calibration. The sophisticated measuring procedure and modern electronics in the MAS greatly simplifies the measurement of gas flow.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za

Amphenol connectors target agricultural machinery

RS Components has announced availability of a new series of Isobus circular connectors, manufactured by Amphenol. The key application area for this series of cable connector sockets is in agricultural and forestry vehicles, as the series offers a standardised connection that meets ISO 11783-2. The standard specifies the physical layer for twisted, non-shielded quad-cable operating in a 250 kbit/s serial data network for control and communications between agricultural or forestry tractors and machinery and their implements, whether these devices are mounted, semi-mounted, towed or self-propelled. A key feature of the series of nine-pole cable-mount circular connectors is its two size 8 power contacts for 6, 10 and 16 mm 2-wire gauge. Offering rapid and secure assembly, cable connector variants in the series also include field-installable devices, as well as over-moulded cable assemblies. Rated for 24 V operations, the series also meets IP67 and IP69K ratings to protect against water and dust ingress. To complement the series, a selection of dust caps is also available.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za

Tamper protection with RFID safety sensors

The new RFID sensors from ifm electronic can display switch-off operation directly using the LED display when the actuator slowly leaves the sensing range. This means that, for example, the door and the actuator can be ideally paired to each other and higher machine uptime is achieved. All sensors in the range meet the requirements ISO 13849-1 and IEC 62061. Even if 32 sensors are connected in series, the highest safety level is maintained.

Non-contact door monitoring
The non-contact RFID sensors allow reliable monitoring of door status without any wear. The part numbers for this new product are: MN700S; MN701S; MN702S; MN703S; MN704S & MN705S

For more information contact ifm electronic SA, 086 143 6772, info.za@ifm.com, www.ifm.com
**Easy-to-read identification system**

Such has been the success of the Easy Read system locally that it has been adopted exclusively by a major hydraulic equipment manufacturer for the past decade to tag hoses. A diversified power management company has also deployed Easy Read for a similar application, while a leading supplier of engineering support services to the energy, process, mining, and construction industries uses the system to tag maintenance records for its rental equipment.

Easy Read is essentially a tagging system comprising pre-cut characters (A to Z) and numerals (0 to 9), in addition to special symbols, and available in a range of sizes. Being pre-cut, there is no need for specialised tooling. End users can also only acquire those letters, numbers or symbols applicable to their specific serial numbers, enhancing the system’s holistic effectiveness.

The Easy Read characters are slid onto a carrier, which is then attached to any items such as hoses, cables, machinery, or they can be used as ‘flag’ tags. They are manufactured from Grade 316 stainless steel to withstand highly-corrosive environments.

Easy Read can also be used in conjunction with PPA-coated Grade 316 stainless steel reusable cable ties to provide a total cost-effective ‘tag-and-clamp’ solution. These cable ties are, in turn, also colour-coded for easy identification. Characters can be slid directly onto a 10 mm or smaller cable tie to create a self-contained ‘wrap’ tag.

Letters, numbers, and symbols for the Easy Read system are available in bags of ten or 100, as well as being supplied in complete Easy Read kits. These kit bags can be customised according to clients’ specific requirements. The visibility of the tags in dim or low-light environments, as well as in inaccessible or confined spaces, is enhanced by using special colour-coated carrier strips.

**For more information contact**
Rosa Dos Remendos, Banding & Identification Solutions Africa,
+27 11 974 0424,
rosa.remendos@banding.co.za,
www.banding.co.za

**Cylinder sensors for robust fixing**

The new cylinder sensor from ifm electronic can be used for common C-slot cylinders such as from SMC. Its height of only 5 mm allows flush mounting. Especially this cylinder manufacturer requires slot-mounting and, often, 2-wire connection.

**Long life**
The sensors’ function without contact and almost without wear. Their life is much longer than that of the common reed contacts. With the GMR (giant magneto resistive) cell, the sensor detects the magnet on the piston through the aluminium wall of the cylinder. This saves expensive repair and downtimes. Part numbers are: MKS362; MKS363 and MKS365.

**For more information contact**
ifm electronic SA, 086 143 6772,
info.za@ifm.com,
www.ifm.com

**Self-contained photoelectric barrel-mount sensors**

Banner’s new T18-2 photoelectric sensors have an FDA-grade shatterproof plastic housing and are IP69K-rated and Ecolab-certified to protect against water ingress and chemical washdown.

**IP69K and epoxy encapsulation for wet environments:** the T18-2 series sensor is designed to withstand high pressure and temperature washdown. The epoxy fill eliminates internal air cavities in the housing that could lead to condensation inside sensors during temperature cycling.

**Ecolab certified FDA grade plastic:** the sensors have been tested by Ecolab to certify that they resist damage when exposed to common cleaning chemicals. The plastic used throughout the T18-2 is made of FDA-approved, shatterproof plastic for use on food production lines.

**Improved design for easier cleaning:** crevices have been minimised to eliminate debris build-up. The knurls have also been removed from the nut and the light pipes have been over-moulded for easy cleaning. All labels have been removed and replaced with permanent laser etching. Installing the nut, optional seal kit, and bracket will cover all exposed threads on the nose.

**Durable ultrasonic weld for a superior seal:** ultrasonic welding is an advantage of using an all-plastic housing and creates a superior joint. Metal sensors contain plastic windows and other components that are joined mechanically or with adhesives. The joints are then subject to thermal shock because the metal and plastic components expand and contract at different rates, creating small gaps and allowing water inside the sensor. Ultrasonic welding fuses plastic components into one solid piece of durable plastic that is not affected by thermal shock.

Target applications include harsh washdown environments with temperature cycling, such as food and beverage processing, packaging and cold storage.

**For more information contact**
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**Pneumatic test pump kit**

Fluke Calibration now offers the 700HPPK Pneumatic Test Pump Kit, a rugged, portable tool that generates and adjusts pneumatic pressures up to 21 MPa without requiring a nitrogen bottle or other external pressure supplies. It is ideal for generating high pressure in the field to devices under test (DUTs) such as transmitters, controllers and analog gauges.

The unit reaches pressure in 20 seconds and a detachable pressure adjustment system allows technicians to make fine pressure adjustments to 0.05% of reading, or better.

The lightweight and portable pneumatic pressure kit is designed for use in the laboratory or the field, with collapsible feet and a built-in handhold making it portable. Inline filter and desiccant systems protect the device against contamination from the DUT and it works on almost any surface, so technicians do not need a laboratory bench or flat area in the field.

The 700HPPK has the versatility to cover a wide range of workloads. It features a 2-metre pressure line and assorted pressure fittings to connect to a variety of DUTs for wide workload coverage. Its ¼ NPT female reference gauge connector facilitates easy reference gauge switching. No extra tools are required, reducing the equipment and accessories technicians need to carry to the job site. The calibration manifold attaches and detaches smoothly via quick detent pins that reduce setup and pack-up time. A second model, the 700HPP, is available specifically for high pressure source users.

For more information on Fluke Calibration 700HPPK Pneumatic Test Pump Kit, or for info about seminars, demos or to locate the nearest dealer, contact Comtest on 010 595 1821 or sales@comtest.co.za

**Reliable object detection**

Leuze has expanded its portfolio of optoelectronic and inductive switches with the introduction of a range of capacitive proximity switches, which make it possible for users to procure complete solutions for their detection requirements from a single source.

The introduction of contactless, wear-free switches, which are resistant to electromagnetic influences, interference and contaminants in the air, such as dust, will have major advantages for end users. The capacitive switches are available in a cylindrical or cubic design, as well as embedded or non-embedded versions for a wide range of mounting options. Due to their semiconductor technology, the Leuze sensors have a long life expectancy, regardless of the detection and switching frequency.

The new variants facilitate contactless detection of numerous different objects and media, regardless of the shape. These sensors are particularly suitable for detecting objects in harsh and dirty environments due to the IP67 rated housing.

These Leuze sensors can ‘see through’ certain materials to provide optimum accuracy in difficult sensing applications such as those found in food and beverage and printing and packaging operations. The devices can detect products in outer packaging and behind container walls, as well as check fill levels and monitor these for completeness.

For more information contact Gerry Bryant, Countapulse Controls, +27 11 615 7556, bryant@countapulse.co.za, www.countapulse.co.za

**Getting alarms to the right people**

Getting alarms to the right people at the right time can sometimes be a difficult exercise. Management, supervisors and engineers alike often need to be made aware of certain alarms that are triggered, be it whether they are on or off site. The Short Message Service SMS (or text messages) from the GSM network provides a dynamic and efficient tool to inform personnel of alarm conditions at any time.

Adding a Teleterm Silent Sentry SMS device to an alarm annunciator system, such as the Omni16C, is simple to do and provides an immediate means of getting alarms to all personnel. Functionality such as ‘escalation’ is standard; therefore if a respondent does not acknowledge an alarm, another alarm can be sent automatically to the next person in the respondent list, which is ideal for ensuring alarms receive a response. Logging of alarms is also standard using the built-in SD card slot, allowing recording of all alarm history for review.

For condition monitoring, typical plant statuses are logged and managed chronologically. Other benefits include:

- Select alarms for specific personnel.
- Send queries for alarm status information via sms.
- Modbus Communications to any enabled device.
- Hardwire inputs.

For more information contact Ian Loudon, Omnimflex, +27 31 207 7466, sales@omnimflex.com, www.omnimflex.com
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